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J. R. SCHRAMM, Editor-in-Chief

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No. 6

ENTRIES 4963-6035

AGRONOMY (CROPS AND SOILS)

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(See also in this issue Entries 5079, 5088, 5112, 5115, 5116, 5117, 5204, 5209, 5261, 5269, 5270, 5277, 5278, 5279, 5280, 5281, 5287, 5289, 5298, 5304, 5311, 5313, 5341, 5345, 5536, 5654, 5667, 5718, 5790, 5813, 5814, 5822, 5842, 5846, 5847, 5869, 5874, 5885, 5887, 5974)

CROP SCIENCE (ARVICULTURE)

4963. ANONYMOUS. Expansion of celotex industry. Australian Sugar Jour. 16: 509. 1924.—Statements and statistics regarding the actual and proposed growth of the celotex industry in Louisiana indicate promising possibilities in this field.—*Nellie E. Fealy*.

4964. ANONYMOUS. [Map of rice areas.] Rice Jour. 27: 14-15. 1924.—This map of the U. S. A. shows rice areas and gives acreage and selling points in each locality where rice is grown.—*L. Pace*.

4965. ANONYMOUS. The celotex mission. Australian Sugar Jour. 16: 585-586. 1924.—One ton of megass [bagasse] is said to yield 3,000 square feet of celotex, which could be retailed in America for £40. Hence, according to this statement, every ton of sugar leaves behind it practically £40 worth of celotex, and this should be a considerable item in reducing the cost of producing a ton of sugar. It is suggested that the immense amount of growth from the macrozamia to the bamboo grasses throughout the tropical regions might also be converted into celotex.—*Nellie E. Fealy*.

4966. ANONYMOUS. Utilidad de las leguminosas en la agricultura. [The value of legumes in agriculture.] Rev. Soc. Rural Córdoba [Argentina] 21: 6428-6438. 1922.—This article discusses the nature of leguminous plants and their ability to form nitrates from free nitrogen, thus increasing soil fertility. Methods of handling legumes suitable to Argentine conditions are outlined.—*John A. Stevenson*.

4967. ARMSTRONG, H. C., AND T. B. MUNROE. The new use for megass [bagasse]. Australian Sugar Jour. 16: 469-475. 1924.—The life history of celotex and the preliminary steps taken with a view to introducing its manufacture into Australia are briefly summarized. It has been found that as insulation this material rendered a house 15-20° cooler in summer and in winter saved 1/3 of the fuel previously employed in maintaining a given temperature.

Besides its high insulating value it has sound-deadening and acoustic values, has the advantage of extreme lightness, is water-proof, is practically without fire risk, and there is a constant supply of the megass.—*Nellie E. Fealy.*

4968. B., C. A. **Rice.** [Rev. of: COPELAND, EDWIN BINGHAM. **Rice.** *xiv* + 352 p. 18 pl. Macmillan & Co.; London, 1924.] *Nature* 114: 455-458. 1924.—There should be added to the author's agricultural classification, 2 or 3 more classes. The most interesting of these is "dry paddy" grown on dry soil under intensive dry farming methods; "we believe it is one of the curious payira crops, which will grow to maturity once a sufficient fall of rain insures satisfactory germination." Indian paddy should be divided into 2 classes—swamp and irrigated. The deep water paddy also might be included. The reviewer questions the statement that in wet paddy the plant depends upon ammonium salts rather than nitrates and discusses this at some length. In connection with the length of time required for maturity the reviewer states that in parts of the Tanjore delta it is the custom to plant short and long seasoned varieties together, the former being harvested while the latter is still in the tillering stage.—*O. A. Stevens.*

4969. BELSCHNER, H. G. **Common feeding stuffs used for live stock in New South Wales.** *Agric. Gaz. New South Wales* 35: 873-882. 1924.—The following feeds are discussed: chaff, wheat-straw, wheat, barley, oats, maize, beans, cow peas, bran, green fodders and silage.—*L. R. Waldron.*

4970. BLANCK, E., UND F. ALTEN. **Ein Vegetationsversuch mit "Asahi Promoloid."** [A vegetation experiment with "Asahi Promoloid."] *Jour. Landw.* 72: 139-143. 1924.—"Asahi Promoloid" is evidently a by-product of the Asahi Glass Company of Japan. The material contained 88.31% water and the dry substance contained, along with other elements, 17.68% MgO, 0.85% K₂O, and 0.384% P₂O₅. Pot experiments with soy beans showed a slight increase in seed production due to its use.—*F. M. Schertz.*

4971. BLARINGHEM, L. **Etudes sur la Selection du Lin. II.** *Rev. Bot. Appl. et Agric. Coloniale* 4: 633-652, 737-745. 1924.—Statistical researches upon the degeneration of fiber flax is the subject of this 2nd paper. All fiber flaxes of Northern France are from seed of Russian origin. Those grown from seed imported directly from Riga are called "*Lins de tonne*;" if from seed grown 1 generation in France they are called "*Lins apre tonne*;" and if grown many successive generations in France, they are called "*Lins indigenes*."—Flax deteriorates in height and in fiber production when grown for successive generations in France, except in the case of selected pedigreed lines which resist changes due to differences in climate. Two modes of deterioration may be distinguished—deterioration in the genetic constitution of lines, and deterioration of mixtures. This 2nd form troubles the farmers. All flax seed coming from Russia consists of mixtures.—Eight lots of indigenous flax and 3 lots from Russia were grown in 2 series of plats, 1 in partial shade of tall forest trees, and the other in open land exposed to bright sunlight all day. In every instance the flax in the shade was superior to that in the bright sun. The indigenous flaxes in sunny ground have an average length of stem shorter by 1/6 than the same lots in shaded ground. By taking the numbers of stems with different measurements at 5 cm. intervals and arranging them in regular series, it is found that those grown in shaded ground agree remarkably well with the terms of $(a + b)^9$ for the indigenous flaxes and $(a + b)^7$ for the flaxes *de tonne*. Those grown in sunny ground do not agree quite so well.—A relatively small but increasing number of the best plants in indigenous flaxes have septa in the capsules ciliate on the inner margins, the other plants having smooth margined septa. The flax of Morocco and also the wild flax, *Linum angustifolium* L., most closely related to the cultivated flaxes (*L. usitatissimum* L.), all have ciliate septa. The degeneration of fiber flax from Russia, when cultivated in France, is presented under 2 aspects: (1) A general diminution in height, of a physiological order, resulting from more intense sunlight in the early stages of growth; (2) a notable increase in the mixtures of lines with an increase of the poorer plants from the earlier ripening seed, since the plants are harvested before the later seed are mature. (See also Bot. Absts. 13, Entry 2495.)—*L. H. Dewey.*

4972. BONINO, ALFREDO. **Cantidad de semilla de alfalfa a sembrarse por hectarea.** [Amount of alfalfa seed to sow per hectare.] *Agric. Mexicano y Hogar* 40: 96-97. 1924.—

The amount of alfalfa seed to be sown per hectare varies under Mexican conditions from 10 to 40 kgm.—*John A. Stevenson.*

4973. BREAZEALE, J. F. *The injurious after-effects of sorghum.* Jour. Amer. Soc. Agron. 16: 689-700. 1924.—The injurious after-effect of sorghum is due to the presence of a toxic body formed during the decomposition of the stubble. This toxic body is soon volatilized or decomposed. During the decomposition of the stubble, and while the toxic body is still in the soil, the flora that generates the CO_2 is largely killed off. A deflocculation of the soil results.—*F. M. Schertz.*

4974. BRIOUX, CH. *Marche de l'absorption des principes fertilizants chez le colza; ses besoins en engrais et sa fumure rationnelle.* [Progress of absorption of the fertilizing principles by rape; its fertilizer needs and rational fertilization.] Ann. Sci. Agron. Française et Etrangère. 40: 1-21. 1923.—Experiments were conducted on common and umbrella rape to determine the rate of absorption of the different fertilizing elements at different stages of growth. Five stages of development were studied: (1) Starting of growth, (2) beginning of stem formation, (3) beginning of blossoming period, (4) end of blossoming period and (5) maturity.—It was found that the rate of absorption for potash, lime and phosphoric acid was regular in its progression, but nitrogen varied in amount at different periods of growth. The phosphoric acid was absorbed in greatest amount at the time of flower formation and at the time of the formation of the seed. The grain contained the largest part of the nitrogen and phosphoric acid, while nearly all of the potash and lime were in the stalks and walls of the pods. The sulphur was about evenly distributed. The seed contained 56% of the nitrogen and 60% of the phosphoric acid but only 9% of the potash and lime.—A hectare of rape was found to need 200 kgm. of potash, 120-130 kgm. of nitrogen, 70 kgm. of phosphoric acid, 170 kgm. of sulphuric anhydride, and 230 kgm. of lime. A detailed system of fertilizing is recommended by the author.—*R. A. Mooney and A. B. Beaumont.*

4975. BROOKS, G. B. *Cultivation and fertilizing. Artificial farm yard manure.* Australian Sugar Jour. 16: 611-613. 1924.—Through the researches of Richards and Hutchinson, at Rothamsted, the Adco process of converting straw, etc., into fertilizer was discovered. Subsequently the process was taken over from the Rothamsted Exp. Sta. by the Agricultural Development Co. with a view to making it a commercial success. The reasons underlying the development of this process are that in many districts of England the potato is the principal crop, that rotation is necessary with this crop and that wheat has been found the most satisfactory for use in this connection, that it is not practicable for potato growers to convert their wheat straw into farmyard manure by keeping cattle, and that owing to the increase of mechanical transportation the available supply of the stable manure which farmers purchased from near-by towns is constantly decreasing. The usual procedure in treating straw by the Adco process is to spray it thoroughly, as it is being stacked, with water mixed with the necessary chemicals. A ton of the chemicals is sufficient to make from 45 to 60 tons of manure. Pouring the solution into holes made in the top of the stack has not been successful. It is suggested that in case of lack of sufficient water the deficiency might be overcome by depositing the material in a trench or hollow and covering it after treatment with a layer of soil. Probably the greatest obstacle in converting leaves and tops of sugar cane into fertilizer by this process would be the collecting and stacking of the material.—*Nellie E. Fealy.*

4976. BROWN, W. H. *Coonamble experiment farm.* Some experiments with conserved fodder. Agric. Gaz. New South Wales 35: 861-870. 4 fig. 1924.—Forage crops produced in times of abundance and conserved in pit silos were found to yield large profits when fed out in times of scarcity caused by drought. Detailed feeding results are given. Notes are given relative to making and filling pit silos.—*L. R. Waldron.*

4977. BROWNE, C. A. *The relation of chemistry to agriculture.* Science 60: 575-580. 1924.—This address includes a sketch of the progress of agricultural chemistry with particular reference to the work of van Helmont and Liebig, and a brief survey of the various agricultural projects undertaken by chemists.—*C. J. Lyon.*

4978. BUNKER, F. H. *Preparación y cultivo de semilleros de tabaco.* [Préparation and cultivation of tobacco seed-beds.] Rev. Agric. Puerto Rico 13: 155-159. 1924.—The author

discusses the preparation and handling of tobacco seed beds under Porto Rican conditions.—*John A. Stevenson.*

4979. BURGESS, J. L. *Annual report of the Botany Division.* North Carolina Dept. Agric. Bull. (Unnumbered). 4-11. 1925.—This report contains a formal statement of the work of the Division of Botany of the North Carolina State Department of Agriculture for the year ending November 1, 1924. It contains a statement of the distribution of nitro-cultures, the recleaning of tobacco seed and the analysis of 2,757 seed samples.—*F. A. Wolf.*

4980. CALDER, J. W. *The best stage for cutting wheat.* New Zealand Jour. Agric. 28: 400. 1924.—The writer confirms for the 2nd season the results published in this Journal of June, 1923, that the best stage (Stage C) of ripeness for cutting wheat is when the straw is practically yellow, and the grains in the riper heads are so firm that no milk or dough can be squeezed out, but soft enough to cut easily with a thumb nail. The reduction in weight of 100 kernels cut 3 days earlier than Stage C was 0.149 ± 0.047 grams, while cutting 3 days later than Stage C gave no significant difference in weight but involved greater risk from shattering.—*J. W. Taylor.*

4981. CANTAB. *Agricultural research.* Nature 114: 465. 1924.—This is a comment upon the address of Sir John Russell. The author deprecates the idea of directed research. The need is for research in pure science unhampered by the necessity of producing practical results.—*O. A. Stevens.*

4982. CHAPLIN, M., and C. H. GOULDEN. *Milling quality of Saskatchewan wheat.* Sci. Agric. 2: 283-305. 1922.—The milling and baking quality for bread flour of the leading varieties of wheat have been studied for a period of 8 years. Marquis, Red Fife, Kitchener and Red Bobs, all proved to be of excellent quality. White Bobs, White Fife and Taylor's Wonder are white wheats of high quality. Ruby has shown poor quality in the 2 years tested, while Club, Redstone, Alaska, Kinley, Stanley and Red Durum (D5) are undoubtedly poor in milling and baking quality. Kubanka is recommended for growing by farmers who desire a durum wheat. The time of cutting wheat was found to influence milling and baking quality and the writers recommend harvesting preferably in the late dough stage. Substantial improvement results from later harvesting but field risks are increased. The time of seeding had little influence on the quality of the grain, provided the crop was sown early enough to escape rust and frost damage. Apparently no district showed evidence of producing wheat of outstanding high or low quality. Milling and baking tests are of great economic value to the plant breeder in improving a strain or variety of wheat as they enable him to eliminate the poor quality strains.—*J. W. Taylor.*

4983. CLAYTON, E. S. *Impressions of Wimmera farming methods.* Agric. Gaz. New South Wales 35: 837-842. 1924.—The methods employed at Wimmera, Victoria, are described under the headings of culture, seeding, fertilizers and rotations. The main wheat variety is Federation. Seeding commences late in July, using 75 to 85 pounds per acre. It has been found that with an annual rainfall of 15 inches, each increase of 15 pounds over 45 pounds of seed used per acre resulted in successive increased yields of 1 bushel per acre. Superphosphate is applied at the rate of about 100 pounds per acre.—*L. R. Waldron.*

4984. CLEGG, GLADYS G. *The breaking load of single cotton hairs.* (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 15: T 1-7. 1924.—The frequency array and mean breaking load of single hairs of Sea Island (several varieties), Peruvian, Afifi, Californian, and Punjab American cottons are given.—It is suggested that the percentage of hairs which break at loads below 1.5 gm. be taken as an index of the amount of thin-walled or dead cotton.—*From author's summary.*

4985. CLEGG, GLADYS G., and SYDNEY CROSS HARLAND. *Neps in cotton fabrics and their resistance to dyeing and printing.* (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 125-132. Pl. 1. 1923.—"The difference in colour of the neps is considered to be mostly optical in nature, for reasons which are given, but the nep aggregate apparently contains debris of hairs consisting of primary wall only, which are glassy in appearance and remain undyed. The effect of mercerisation on the difference in colour shown by neps in an indigo-dyed fabric is to render such difference less conspicuous. This is considered to be due to alteration in the shape of the cross section, reducing dispersion effects, and to an increase in the wall

thickness, which causes an increased capacity for dye. The cell-wall thickness of cotton hairs is considered in detail, and reference is made to the recognised causes of neps during manufacture. The effect of environmental and genetic factors on cell-wall thickness is shown to be complex, and it is concluded that much of the thin-walled cotton arises through death of seeds before maturity, either through competition, genetic factors, or attack by parasites. Elimination by genetic methods of strains characterised by excessive amounts of thin-walled cotton is suggested to the cotton breeder, as well as a detailed study of the physiological and genetic factors influencing its amount."—*From authors' summary.*

4986. CROSS, WM. E. *Estudios con variedades de cañas importadas.* [Studies with imported cane varieties.] *Rev. Indust. y Agric. Tucuman* 14: 89-108. 4 fig. 1924.—A report is given of the yields and behavior of imported cane varieties grown during the seasons of 1922 and 1923 at the Tucuman Exp. Sta. The variety P. O. J. 105 (Egyptian amber) proved inferior in yield to P. O. J. 36 and 213 and more susceptible to disease. D. 1135 gave fair results but was not equal to the 2 standard varieties grown in the province. Yon Tan San is a cane similar to Kavangire. Four Peruvian varieties, because of susceptibility to mosaic and freezing, were not of sufficient promise to be grown further. Kassoer and Chunnee, 2 small-stalked varieties similar to Kavangire, are of value for crossing to obtain mosaic resistant types. In addition, a considerable number of Javan (P. O. J.) seedlings were tested and found to vary greatly in vigor, yield, disease and cold resistance.—*John A. Stevenson.*

4987. CROSS, W. E. *Experimentos con la caña criolla.* [Experiments with native cane.] *Rev. Indust. y Agric. Tucuman* 14: 16-19. 1 fig. 1923.—Fertilizer experiments were carried on with native cane over a period of 5 years. Due to inroads of the mosaic disease and other unfavorable conditions there was a rapid falling off in yields and the experiment was abandoned. It was noted that higher yields were obtained on plots where the trash had been burned off soon after cutting.—*John A. Stevenson.*

4988. CROSS, WM. E. *Informe sobre la gira de estudio realizada en el Chaco.* [Report on a trip to Chaco.] *Rev. Indust. y Agric. Tucuman* 13: 187-193. 4 fig. 1923.—The writer, Director of the Tucuman Exp. Sta., accompanied by the Station Horticulturist, made a trip to Chaco in March, 1919, to study cotton growing conditions in that Province. The idea had gained prevalence in Tucuman that local temperature and rainfall conditions were unfavorable to successful cotton growing in contrast to Chaco where very satisfactory results were being obtained. Conditions, however, were found not to differ greatly in the 2 provinces, and the writer outlines a plan for experimental and demonstrational work with cotton to be undertaken in Tucuman.—*John A. Stevenson.*

4989. CROSS, WM. E. *Informe sobre las cañas "Tucumanas" de semillero.* [Report on Tucuman seedling canes.] *Rev. Indust. y Agric. Tucuman* 14: 37-49. 1923.—The production of seedling varieties of sugar cane was commenced in Tucuman in 1917 and a considerable number have been produced each year. As rapidly as possible these are planted out for field trials and the usual tests made. The present paper is a detailed report of results obtained with these seedlings during the seasons of 1922 and 1923. Many of the seedlings have succumbed to the mosaic disease, but some are of distinct promise. The results are given in tabular form.—*John A. Stevenson.*

4990. CROSS, WM. E. *La situación de la industria azucarera en Luisiana.* [The situation in the Louisiana sugar industry.] *Rev. Indust. y Agric. Tucuman* 15: 5-9. 1924.—The author in a previous article (*Ibid.* 14, 1923) attributed the falling off in yields of sugarcane in Louisiana to the mosaic disease. Other workers have taken issue with this conclusion and their papers are reproduced following the present article.—*John A. Stevenson.*

4991. CROSS, WM. E. *Los experimentos de la estacion experimental sobre el algodón.* [Cotton experiments of the experiment station. 1910-1923.] *Rev. Indust. y Agric. Tucuman* 13: 161-172. 7 fig. 1923.—Cotton experiments at the Tucuman Exp. Sta. were initiated in 1910 with a series of varieties obtained from Chaco Province and various foreign countries. In 1919 a new series of experiments with varieties from the Chaco, the U. S. A., Peru and Brazil was started. These varietal tests showed great variation in yields, ranging from 164 to 818 kgm. per ha. Low yielding varieties were dropped from the experiment. Ob-

servations on the behavior of the varieties indicated that due to the changed environmental conditions variations were taking place in the varieties under trial. Selection work was, therefore, undertaken to obtain types adapted to Tucuman conditions. Experimental work was also performed to ascertain the proper time of year for planting, the proper distance between rows and the value of irrigation.—*John A. Stevenson.*

4992. CROSS, W. E. Observaciones sobre la situacion de la industria azucarera en Luisiana. [Observations on the condition of the Louisiana sugar industry.] *Rev. Indust. y Agric. Tucuman* 14: 8-13. 2 fig. 1923.—The author reviews a report on the work of the Louisiana Sugar Planters' Association wherein a falling off in yields is attributed to impoverishment of the soil through continued cropping. He suggests that the mosaic disease is the real cause of the trouble. The use of hardy varieties is recommended, which will make it possible to do away with the practice of windrowing.—*John A. Stevenson.*

4993. CROSS, WM. E. Sobre el procedimiento de quemar la caña en la cosecha en vez de pelarla. [Concerning the procedure of burning cane in harvesting in place of stripping.] *Rev. Indust. y Agric. Tucuman* 14: 29-36. 2 fig. 1923.—The stripping of the leaves and particularly the removal of the closely adhering leaf-sheaths at the time of cutting constitutes a laborious and expensive part of the harvesting operations. This work is increased in the case of Kavangire cane and similar varieties with many small stalks per stool. Burning over the fields just previous to cutting lessens the labor involved to a considerable extent, often cutting the costs by as much as one-half. Experimental work along this line in Hawaii and elsewhere is reviewed. In Tucuman, experiments were conducted with Zwinga and Kavangire canes. Chemical analyses of the juice indicated that no appreciable injury was done by burning. In tropical countries cane burned over must be cut and milled promptly as deterioration sets in within 2-3 days and proceeds rapidly. Under Tucuman conditions, however, this process is much delayed, since cool and even cold weather prevails at harvesting time.—*John A. Stevenson.*

4994. CROSS, WM. E. Trebol No. 9. Una nueva forrajera y abono verde de invierno. [Clover No. 9, a new forage and green manure crop for winter.] *Rev. Indust. y Agric. Tucuman* 14: 109-112. 2 fig. 1924.—The experiment station of Tucuman has been searching for satisfactory winter forage crops. Oats and barley are low in nitrate content, while ordinary types of alfalfa fail to make growth in the cold season. One variety, "Inverniza No. 3," was finally found which was of value in this connection. Best results have been had, however, with an annual form of *Melilotus alba*. This clover gives 2-3 cuttings during the winter and can be used either as a forage crop or for green manure. It can be fed either green or dried. It is particularly recommended for growth in rotation with cane and cowpeas. Cultural directions are given.—*John A. Stevenson.*

4995. DRAGHETTI, A. Estudio comparativo de la resistencia mecánica el encamado de algunas variedades puras de trigo. [Comparative studies of mechanical resistance to lodging of certain pure varieties of wheat.] *Bol. Agric. Tec. y Econ. [Spain]* 14: 405-407. 1922.—The author reviews his studies (published in detail in *Staz. Sper. Agrarie Italiane*) on the lodging of wheat varieties. The various factors involved were studied and a biometrical formula was evolved.—*John A. Stevenson.*

4996. ESCOBAR, ROMULO. El trigo de Don Jesus. [Don Jesus wheat.] *Agric. Mexicano y Hogar* 40: 69-76, 103-107, 130-134, 160-164. 1924.—A variety of wheat to which the name of "Don Jesus" has been given has been found in northern Mexico, which not only gives high yields but is resistant to bunt (*Tilletia* spp.) and possibly to other wheat diseases. Experimental plantings were made on a considerable scale in comparison with other native and introduced varieties including Sonoreño blanco, Chileno and Barboñ.—*John A. Stevenson.*

4997. FOSTER, L. D. Testing of New Zealand-grown wheats. *New Zealand Jour. Agric.* 28: 401-405. 1924.—The author reports the results of testing a series of wheat samples for milling qualities. Some of the varieties compared favorably in amount of flour with the results obtained the previous year, while others did not show up so well. No very apparent differences in milling qualities regarding the wheat-growing districts were observed. The calculated weight per bushel in the samples tested did not appear to be generally correlated with the yield of flour.—*J. W. Taylor.*

4998. GABARA. Description de las principales operaciones agricolas que se verifican en Valencia en el cultivo del arroz. [Description of the principal agricultural operations carried out in Valencian rice culture.] Información Agric. [Madrid] 14: 27-31. 2 fig. 1924.—The author discusses the system of rice culture employed in Valencia, from seeding to harvesting.—*John A. Stevenson.*

4999. GARDNER, J. S., AND C. W. MATHEWS. Potato growing in Kentucky. Kentucky Agric. Exp. Sta. Circ. 34. 21-58. 1924.—This circular considers soil management, fertilization, seed storage, planting, cultivating and harvesting of 1st and 2nd crop potatoes in Kentucky. Diseases and insects and their control are discussed. The varieties grown in Kentucky are considered.—*W. D. Valleau.*

5000. GÉRÔME, J. Essais de culture de pomme de terre au Muséum. [Experiments on potato culture at the Museum.] Bull. Mus. Hist. Nat. [Paris] 27: 563-568. 1921.—A series of experiments was conducted at the Museum to ascertain the average weight of seed-pieces best suited for use in planting and the proper spacing to employ. The variety used was "Fin de Siecle." Seed-pieces of 10, 20, and 30 gm. were planted and the harvest was compared with that from whole tubers having a mean weight of 60 gm. Results are completely tabulated and contrasted with those obtained under natural conditions at the farm school in the Vosges.—*John M. Fogg, Jr.*

5001. GILCHRIST, D. A. Improvement of moorland grazing in the north of England. Jour. Ministry Agric. Great Britain 29: 797-800. 1922.—There are 500,000 acres of moorland pastures and rough mountain land in Northumberland. Experiments on the improvement of the moorland have been conducted for some years on several moorland farms in the upper North Tyne and at other centers. It has been found that there is only a limited acreage of moorland which can be profitably improved by basic slag or other phosphate manures and that the areas that can be so improved are those on which small clover plants can be found and where the soil is fairly near the surface. Basic slag may be expected to do good on clay soil with clay or tilly subsoils, which have small clover plants and poorly eaten grasses. In such cases kainit was not required. On moory, mossy and generally black topped land, slag was evidently helpful with probably, in this case, the addition of kainit. Grazing with cattle helps greatly in improving the herbage, as cattle eat far more of the stemmy herbage than sheep. On old grass land with a thick matty covering on the surface, which is a common cause of poverty in moorland hay and grazing land, ploughing out early in the winter with a disc coultter to bury the turf as effectively as possible, is recommended.—*Mary R. Burr.*

5002. GOLINSKA, JADWIGA. Sur la tubérisation des pommes de terre cultivées des boutures. [Tuber formation in potatoes grown from cuttings.] Acta Soc. Bot. Poloniae 21: 60-63. 1 fig. 1924.—The object of these experiments with potatoes was to clear up the relation of fructification to tuber formation.—According to the author the results indicate clearly that prevention of tuber formation does not suffice to bring about development of fruits. The cause of sterility in potatoes, in spite of numerous investigations, is still obscure.—*Hannah Czeccott.*

5003. GRAUL, E. J., AND E. B. FRED. The value of lime and inoculation for alfalfa and clover on acid soils. Wisconsin Agric. Exp. Sta. Res. Bull. 54. 1-22. 4 fig. 1922.—Field and greenhouse experiments indicate that for alfalfa, Colby silt loam that has been cropped needs inoculation and lime and in many cases phosphorus also. Lime and inoculation increased the yield and nitrogen content. The addition of potassium and phosphorus to virgin Colby silt loam did not appreciably increase the growth of alfalfa. The use of lime and inoculation, and potassium and phosphorus on Plainfield sand resulted in very marked increases in crop yield and nitrogen content. Inoculation alone nearly doubled the yield on this soil, while calcium carbonate in addition to inoculation resulted in increasing the yield to 18.28%. As the soil is already infested with clover bacteria inoculation did not affect the yield of this crop but phosphorus and potassium proved decidedly beneficial. Lime in addition to phosphorus and potassium showed no material benefit. A study of the nitrogen content of the soils showed that a large percentage of the nitrogen in the plants comes from the soil. In only a few cases was there any gain in the nitrogen content of the soil due to cropping to clover and alfalfa, these crops being removed from the land. Inoculation for

alfalfa, and in some cases for clover, increased the amount of nitrogen obtained by them from the air.—*H. L. Westover.*

5004. HADFIELD, J. W. **Plant selection and seed production.** New Zealand Jour. Agric. 29: 18-24, 103-107, 159-167. 7 fig. 1924.—Methods used in the selection and growing of plants for seed production at the Moa Seed Farm are given.—*N. J. Giddings.*

5005. HITCHCOCK, A. S. **Botanizing in Ecuador.** Sci. Monthly 19: 611-624. 1924. **Botanizing in Peru,** Ibid. 20: 47-63. 1925. **Botanizing in Bolivia.** Ibid. 20: 163-175. 1925.—These 3 articles describe a trip for the special study of grasses. Full results will be published later.—*L. Pace.*

5006. HOWARD, ALBERT. **Crop production in India. A critical survey of its problems.** 200 p. Oxford Univ. Press, American Branch: New York, 1924.—“Agriculture is and for many years to come must remain India's greatest industry. . . . For the last twenty years a number of men of science have been engaged in exploring the various directions in which the produce of the soil can be increased and improved. . . . The investigations in progress have brought to light a number of problems, the successful solution of which must be accomplished before further advances can be made. From their nature and magnitude, these questions can only be dealt with if the active co-operation of the public is secured.” The aim of the book is, then, to enlist the interest of the public and to stimulate further research.—Part I discusses the soil under the following subheadings: Surface-drainage and erosion, soil-aeration, irrigation and water-saving, and the nitrogen and alkali problems.—Part II, in discussing “The crop,” subdivides the subject thus: Economic significance of root development, improvement of varieties, distribution of seed, the fodder problem, cotton, wheat, rice, sugar-cane, fibers, oil-seed, tobacco, pulses, fruit-growing, and diseases.—Under Part III, “Organization,” the ideal investigator, and the organization of research are discussed.—*Frederick V. Rand.*

5007. HU, H. H. [Importance of Chinese economic plants.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 9: 723-729. 1924.—This is a general discussion of the importance of Chinese economic plants. Many native plants are mentioned for their economic significance.—*Chunjen C. Chen.*

5008. INTERNATIONAL GENERAL ELECTRICAL COMPANY OF SCHENECTADY. **Electricity in the manufacture of celotex.** Australian Sugar Jour. 16: 509. 1924.—By the process just perfected for the manufacture of celotex, the megass is fed into a cooker where it is combined with chemicals and small amounts of old newspapers, and then as a pulp is fed into rolls, and finally into an enclosed drier, coming out at the end an absolutely dry board. It is used as insulating material in refrigerator cars, cold-storage warehouses and fireless cookers, and especially in dwelling-house construction, in which “it serves as sheathing, plaster base, and wall finish.” A brief description is given of the power equipment of the New Orleans celotex plant.—*Nellie E. Fealy.*

5009. KEMPTON, J. H. **Jala maize.** Jour. Heredity 15: 337-344. Fig. 12-14. 1924.—Jala maize is a giant form of maize found in the vicinity of Tepic, State of Nayarit, on the west coast of Mexico. The plants average 20 feet in height and the ears about 20 inches in length and 9 inches in circumference. The season in the corn growing belt of the U. S. A. is too short for the Jala maize to mature, but in tropical countries with a long growing season, there are undoubtedly in this variety inherent possibilities which would justify the careful attention of breeders.—*H. Cook.*

5010. KING, C. J., H. F. LOOMIS AND D. L. VARMETTE. **Comparison of Pima cotton with Upland varieties in Arizona.** Jour. Agric. Res. 28: 937-953. Pl. 1-3, fig. 1-4. 1924.—Comparison of various phases of development of Pima Egyptian cotton and several Upland varieties, including Hartsville, Durango, Acala, Mebane and Lone Star, was made at the U. S. A. Field Station, Sacaton, Arizona, from 1920 to 1923. Tables presenting the data are given, including a table showing lint percentage, lint index and seed index of each variety from the 1st to 5th picking in 1923. Active flowering and plant growth periods were found to be longest in the Pima variety and shortest in the Lone Star and Mebane. The Upland varieties began flowering and fruiting earlier and had more flowers and larger bolls, but the approximately 40% greater boll shedding in the Upland cottons allowed the Pima to compare

favorably in yield. The mean period for boll development was found to be from 8 to 15 days longer in the Pima than in the Upland cotton, or about 62 days for Pima. Durango required only 47 days to mature bolls but these were from early flowers; in the other Upland varieties the average time required for bolls to mature was 50-54 days. During the first 3 years Pima outyielded the Upland varieties in seed cotton and in 1923 the yields of all were about equal, Acala producing at the rate of 2,406 pounds of seed cotton per acre, followed by Mebane with 2,390 pounds and Pima with 2,368 pounds per acre. General plant characteristics of all the varieties, as they appear in the field, are given. It is stated that the data should be of interest for the cotton producing areas of the Southwest, but have a more direct application to the cotton problems of the Salt River Valley of Arizona.—*H. F. Loomis.*

5011. KONDÔ, MANTARÔ, AND MOTOHARU TAKEDA. Temperature of rice in the straw-bag. (Japanese.) Ryôsyoku Kenkyû [Food Researches] 19: 1-17. 1923.—Since the temperature of rice is a very important problem in rice storage in Japan, the writers made a study of the question from 1916 to 1922, using the several kinds of hulled rice (Genmai) stored in a granary of the Ôhara Institute. The following results were obtained. (1) The temperature of rice grains in a straw-bag varies with the air temperature of the granary, according to the season. (2) There is little variation in the course of a day; rather, it is almost constant, but the temperature of the granary varies greatly in this time, just as does the air temperature out of doors. The temperature of rice in the granary is, therefore, in the course of any one day not always the same as that of the granary itself. (3) The rice temperature is always different from the granary temperature. Generally, the former is higher than the latter in summer and autumn; and especially in September and October the temperature difference is very great; in winter and spring, on the contrary, the former is lower than the latter and in January and February the difference in the respective temperatures is very great. (4) The temperature of unhulled grains (Momimai) in straw-bags is in summer and autumn a little lower than that of hulled grains (Genmai). (5) If the water content of rice grains is large, then the rice temperature is high; in summer and autumn this is especially noticeable, but not in winter. (6) In rice straw-bags several kinds of insects, which in summer are very numerous, raise the rice temperature considerably. (7) It is important to open the doors of a granary when the outdoor air is cooler and drier than the granary air, otherwise they should be kept shut.—*Authors. (Courtesy Japanese Jour. Bot.)*

5012. KONDÔ, MANTARÔ, AND MOTOHARU TAKEDA. Variation in the water content of rice grains in straw-bags during storage. (Japanese.) Ryôsyoku Kenkyû [Food Researches] 20: 1-14. 1923.—From 1915 to 1922 the writers have stored several kinds of hulled rice grain (Genmai) in straw-bags in a granary of the Ôhara Institute at Kurashiki and studied the variation in the water content of rice grains during the time of storage. The following results were obtained: (1) The water content of rice grains in straw-bags in a granary decreases gradually during the years that they are stored. (2) According to the season, the water content of rice grains varies greatly; in June and July it is greatest, and in December and January least, since it is greatly affected by the atmospheric humidity. (3) If various kinds of rice grains of different water content are stored together, it will be seen that their water content gradually equalizes, but after several years the rice grains lose water gradually and become dry. In this case it is observable that those rice grains that were driest at first lose most water. At last the water content of rice grains becomes very different according to the degree of dryness of the grains in the beginning. (4) The writers found no special difference in the variation of water content between different qualities of rice grains or between hulled (Genmai) and unhulled rice grains (Momimai).—*Authors. (Courtesy Japanese Jour. Bot.)*

5013. KONDÔ, MANTARÔ, AND MOTOHARU TAKEDA. Variation in water absorbing capacity and swelling ability in water of rice grains stored several years in straw-bags. (Japanese.) Ryôshoku Kenkyû [Food Researches] 21: 1-21. 1923.—From 1915 to 1922 the writers stored several kinds of hulled rice grains (Genmai) in straw-bags in a granary of the Ôhara Institute. In the experiments they took 50 gm. of rice grains from every bag and soaked them in water at 25-28°C. for 48 hours. Of course the rice grains then increase greatly in volume and weight. The writers carried on the experiments every month during the time of storage and found that the percentage of increase in weight (= water absorbing capacity) and volume (=

swelling ability in water) varies according to length of storage, as the following results will show: (1) The water absorbing capacity and swelling ability in water of rice grains stored in straw-bags, decreases regularly with length of storage. (2) If x is the number of months during which the rice grains are stored; y is the percentage of increase in volume or weight; and a and n are constants, then the following equation will result: $y = axn$. (3) By experiments and calculations the constants a and n can be determined. Using any hulled grains in storage, if the percentages of increase in volume or weight of grains in water are investigated, then the number of months of storage of the rice grains can be easily found by the equation. (4) When rice grains are soaked in water, the percentages of increase in volume are much greater than those in weight. (5) The water content of rice grains has an effect upon the water-absorbing capacity and swelling ability, but this effect is much fainter than that caused by the length of storage. (6) Notwithstanding the seasonal variation in water content of the grains, the water-absorbing capacity and the swelling ability of water-soaked rice grains varies only in the smallest degree with the season.—*Authors. (Courtesy Japanese Jour. Bot.)*

5014. KÖNIG, J., UND FR. BARTSCHAT. *Nachweis von Roggenmehl in Weizenmehl. [Demonstration of rye-meal in wheat-meal.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 46: 321-339. 1923.—The methods described depend chiefly on the different solubilities of the proteins of wheat and rye in methyl alcohol, ethyl alcohol, acetone, and gypsum-water.—*E. E. Stanford.*

5015. LANDRY, E. S. *The Biloxi soy bean in rotation with rice. Rice Jour.* 27: 11. 1924.—The Biloxi soy bean grown in rotation with rice helps in weed eradication, increases yield of rice and gives a good return as hay or seed beans. If properly handled, it is an effective means of getting rid of red rice.—*L. Pace.*

5016. LEVY, E. B[RUCE]. *Grasslands of New Zealand: The Taranaki back-country. New Zealand Jour. Agric.* 27: 138-156, 281-293; 28: 287-300; 29: 92-102. 51 fig. 1923-1924.—This study of the plant successions in areas which have been deforested includes habits of growth, and suggestions for control of hard fern, bracken fern, water fern, manuka, and pipiripi. A detailed study is made of the hill pastures and the plants found in the sward. A description is included of the mixtures used and methods of procedure in experimental plots where an attempt is being made to destroy the undesirable secondary growth and establish good pasture sward.—*N. J. Giddings.*

5017. LEVY, E. BRUCE. *The grasslands of New Zealand. New Zealand Jour. Agric.* 28: 73-91. 13 fig. 1924.—A detailed description is given of red top (*Agrostis palustris*), brown top (*Agrostis tenuis*) and creeping bent (*Agrostis stolonifera*). Red top is not considered a good grass for New Zealand conditions. Brown top is recognized as very suitable for greens and turf playing grounds. In hill country where there is sufficient rainfall and the land is not suitable for plowing, the brown top is an excellent pasture grass. Creeping bent is not particularly palatable to stock but makes a good growth in water-logged soils.—*N. J. Giddings.*

5018. LINDEMUTH, KARL. *Beitrag zur Biologie von Vicia hirsuta Koch und ihre Bedeutung als landwirtschaftliches Unkraut. [Biology of Vicia hirsuta and its importance as a weed.] Bot. Archiv.* 7: 195-251. Fig. 1-20. 1925.—Damage from foraging is of no consequence in the life of *Vicia hirsuta*; but in the beetle *Oxystoma cracca*, the larvae of which live in the seed, the plant has a severe enemy. The author gives extensive tables of rate of germination of seed with and without husks, and comparisons of the rate with that of other seed.—*William Seifriz.*

5019. McDIARMID, R. W. *Black soil under irrigation with bore water. Results at Coonamble experiment farm. Agric. Gaz. New South Wales* 35: 845-854. 3 fig. 1924.—Crops grown under irrigation in this district are used essentially for grazing. Crops discussed for this purpose are clover, alfalfa, small grain cereals, Sudan grass, and sorghum. Maize, grain sorghums, broom corn, cotton, and rice are also discussed.—*L. R. Waldron.*

5020. MCKEEVER, H. G. *Spacing experiments with Acala cotton in southern California. Jour. Agric. Res.* 28: 1081-1093. Fig. 1-3. 1924.—The author reports the results of spacing experiments with the Acala cotton, an Upland variety, grown under irrigation and hot,

long-season, weevil-free conditions in the Coachella Valley of California. Plants spaced at 6 and 12 inches in the row are compared with unthinned cotton. No reduction in yields occurred when the plants were left unthinned or as close as 2 inches in the row; in some cases even increased yields were secured from unthinned cotton. Plants spaced at 6 inches gave equal or better yields than plants at 12 inches. In the 1st picking the yields were nearly the same for all spacings; in the 2nd picking the 6-inch and unthinned cotton yielded more than the 12-inch, the greatest increase being in the unthinned rows. Since even on the best soil and with the greatest care it is not likely that the plants can be kept in the best condition for the production and retention of fruit throughout the entire season, the ability of close-spaced plants to set a crop rapidly during favorable periods is likely to prove of advantage even under the long-season, weevil-free conditions of the Southwest.—*C. B. Doyle.*

5021. MATTHEWS, F. Crops suitable for ensilage. Trials at Condobolin experiment farm. *Agric. Gaz. New South Wales* 35: 859-830. 1 fig. 1924.—Cape barley gave larger yields than either Sunrise oats or Slav rye. Mixed oats and peas sown later, gave maximum yield. Plats cut after a heavy wind yielded 10% less than similar plats cut the previous day.—*L. R. Waldron.*

5022. MENENDEZ RAMOS, R. Popularidad de las variedades de caña en Puerto Rico. [Popularity of cane varieties in Porto Rico.] *Rev. Agric. Puerto Rico* 13: 137-144. 4 pl. 1924.—Mosaic disease and other unfavorable conditions within recent years have forced the cane planters to give up the old established native types. A very large number of seedlings have been produced by the experiment station or imported from other cane countries. Certain of these have given better results than the varieties replaced. The Uba cane has been successful on the West Coast, D-433 in the Fajardo district, B. H. 10 (12) at Mayaguez and, similarly, other varieties in other parts of the Island. The Experiment Station has under trial a large number of seedlings both native and foreign.—*John A. Stevenson.*

5023. MONICAULT, DE. Rapport sur le fonctionnement de l'Institut des recherches agronomiques en 1922. [Report on the operation of the Institute of Agronomic Research in 1922.] *Ann. Sci. Agron. Française et Étrangère*. 40: 249-280. 1923.—This report gives the history of the Institute from its inception in 1921 to date.—A summary of projects of the various stations and laboratories for 1922 and 1923 and a list of subsidies granted individuals for agronomic research are appended.—*A. B. Beaumont.*

5024. OLIVER, F. W. *Spartina townsendi*. *Gard. Chron.* III. 75: 148, 162-163. 1924.—*Spartina townsendi* was first noticed in 1907 as an aggressive grass for holding tide silt and it was then supposed to be a hybrid between *S. stricta* and *S. alterniflora*. Since then it has spread enormously and prevented filling in of many harbors with the shore silt. It does not succeed if subjected to much over 3 feet of tide.—*P. L. Ricker.*

5025. ORTIZ, LUIS LIRÓ. El cultivo algodonnero en los Estados Unidos de America. [Cotton culture in the United States.] *Bol. Agric. Téc. y Econ. [Spain]* 15: 939-946, 1029-1034, 1118-1130; 16: 57-72, 140-163, 271-287, 341-365, 437-459, 552-567, 623-634, 712-721. 1923-1924.—This is a complete account of cotton culture in all its phases as carried on in the U. S. A.—*John A. Stevenson.*

5026. OSBORN, E. H. Northern Field Inspector's report. *Australian Sugar Jour.* 16: 443-445. 1924.—Among the newer varieties of cane giving locally good results, Q.813 is valued as a quick-growing, early-cutting, high-density cane. In one case 126 tons of 12-months cane of this variety gave an average C. C. S. of 16.2, while 40 tons of 12-months-old ratoons averaged 16.4.—*Nellie E. Fealy.*

5027. PARISH, E. Report on the cost of production of maize, investigation for the season 1921-22. 46 p. Govt. Print. and Stationery Office: Pretoria, 1924.—This interim report of an investigation to determine the cost of producing maize in the Orange Free State, Transvaal, and Natal, is based on records from 39 farms. In addition to data on the cost of production per bag and per acre, consideration is given to the extent that different elements enter into this cost and to ways for reducing the cost of production.—*F. D. Richey.*

5028. PASQUALI, POMPEO. Los forrajes secos o henos. [Dry forage or hay.] *Inspeccion Nacion. Ganaderia y Agric. Bol. [Uruguay]* 43. 1-33. 9 fig. 1922.—The author discusses hay from all points of view as applied to Uruguayan conditions, including kinds, yields,

relation of dry weight to green weight, quality, methods of cutting, drying and storing.—*John A. Stevenson.*

5029. PATE, W. F., AND J. J. SKINNER. Results of fertilizer experiments with cotton and Irish potatoes on some of the principal soil types of North Carolina. North Carolina Dept. Agric. Bull. Unnumbered. 3-69. 1924.—This paper contains the results of experimental work with fertilizers to determine the best proportion of phosphoric acid, ammonia, and potash for each of the crops cotton and potatoes when grown on some of the principal soil types of North Carolina. The results show the differences as indicated by varying yields with the different fertilizer constituents. They show, in addition, the influence of the fertilizer constituents upon the time of maturing and opening of cotton.—*F. A. Wolf.*

5030. PITT, J. M. Farmers' experiment plots. Potato trials, 1923-24. Agric. Gaz. New South Wales 35: 843-844. 1924.—Experiments were conducted on 8 private farms. Yields were generally low, due to drouth.—*L. R. Waldron.*

5031. Q., H. Promising varieties of cane. (Cairns Post.) Australian Sugar Jour. 16: 465. 1924.—Recent experience has shown B. 17, E.K. 284 (sic), and H.Q. 458 to be the most promising varieties of cane for use in supplementing early plantings of Badila in good soils and to establish further standards for less fertile and grub-infested soils. The sugar content and ratooning qualities of B. 147 (sic) are very favorable. This cane is inclined to lose its stoutness as a ratoon, but produces a prolific stool, and appears to be a good self-trasher and to spread out sufficiently to cover the space between rows. H.Q. 458 is most promising as a plant crop. It is not a big stooler, but the sticks are long, thick, and weighty, and it does not show any signs of arrowing. It is a slow, steady grower, and requires fairly good ground and early planting. E.K. 28 is a heavy striker, quick grower, good ratooner, and heavy cropper, but it arrows rather early, and in some tests its sugar content was not so good.—*Nellie E. Fealy.*

5032. RIDRUEJO, D. LEOPOLDO. Neo-cultivo cereal o cultivo en bandas. [Neo-culture of cereals or culture in bands.] Bol. Agric. Téc. y Econ. [Spain] 14: 783-808. 5 fig. 1922.—A system of growing cereals in rows or bands has recently attracted attention in Spain. The system is in reality very old, but its merits have been confirmed by the author's experiments. Wheat, barley, oats and rye when grown in rows or in bands of 2 or more rows gave greatly increased yields both of grain and straw over plantings made in the usual manner. Increases were as high as 30%. The row system permits cultivation during the growing season to keep down weeds and conserve moisture, and also the substitution of machinery for hand labor.—*John A. Stevenson.*

5033. ROSENFELD, ARTURO H. Un cultivo ideal para Tucuman. Ensayas con variedades de algodón en la estación experimental agrícola. [An ideal crop for Tucuman. Cotton varietal tests at the experiment station.] Rev. Indust. y Agric. Tucuman 13: 173-186. 1923.—This is a reprint of an article published in *Ibid.* 4: 207 et seq. 1913.—The author's experiments at the experiment station are reported in detail. Based on the results obtained and other favorable circumstances the growing of cotton on a commercial scale in Tucuman is recommended.—*John A. Stevenson.*

5034. RUSSELL, C. JOHN. Rothamsted and agricultural science. Gard. Chron. III. 74: 345. 1923.—Extracts from an address at the Royal Institution, Feb. 1923, are given. Nitrogen, phosphate and potash fertilizers and stable manure have been found to have different effects on the same crop in succeeding seasons. Their relation to rainfall, soil character and organisms is discussed.—*P. L. Ricker.*

5035. RUSSELL, E. J. Agricultural research. Nature 114: 641. 1924.—This is a reply to CANTAB (Nature 114: 465. 1924. See this issue, Entry 4981.) Advances have come from (1) empirical methods tried by farmers, (2) experiments on empirical lines by trained workers, and (3) advances in pure science. "No honest person working on scientific lines would ever commit himself to a definite promise that a particular investigation would have practical results; he can, however, so conduct it that it will yield sound knowledge." There is great difficulty in keeping in touch with the literature. One of the best methods which has been used at Rothamsted is the bringing in of young men and women now and then from purely scientific laboratories.—*O. A. Stevens.*

5036. S., F. P. **Recent industrial research in cotton.** [Rev. of: Shirley Institute Memoirs, Vol. 2. *vi* + 394 + *v* p. British Cotton Industry Research Association: Manchester, 1924.] *Nature* 114: 369. 1924.—“The volume of memoirs . . . includes 8 summaries of the current literature on such properties of cotton and cotton materials as are studied in more detail in the majority of the 23 other original papers. . . . The summaries are well compiled, and the length of the appended bibliographies . . . illustrates the care taken in their production. They are invaluable to scientific workers in cotton and other allied textile materials, ... The original papers are contributions from the botanical, chemical, and physico-chemical departments of the Shirley Institute.”—The individual papers of botanical nature are being abstracted under the names of their respective authors, as originally published in the *Jour. Textile Inst.*—*Frederick V. Rand.*

5037. S., R. G. **Practical farming.** [Rev. of: (1) HUTCHESON, T. B., AND T. K. WOLFE. *The production of field crops: a textbook of agronomy.* (McGraw-Hill Agricultural and Biological Publications) *xv* + 499 p. McGraw-Hill Publ. Co.: London, 1924 (see *Bot. Absts.* 13, Entry 4794). (2) MALDEN, W. J. *Grassland farming, pastures and leys.* *xxiv* + 314 p. Ernest Benn: London. 1924 (see *Bot. Absts.* 13, Entry 7526).] *Nature* 114: 817-818. 1924.—Recent agricultural books, as illustrated by these 2, show that there is a tendency to write as much for the farmer as for the student.—*O. A. Stevens.*

5038. SALMON, S. C. **Some misapplications and limitations in using Student's method to interpret field experiments.** *Jour. Amer. Soc. Agron.* 16: 717-721. 1924.—Student's method should be used cautiously.—*F. M. Schertz.*

5039. SANCHEZ, ARCADIO. **Algunos datos sobre el cultivo del girasol.** [Data on sunflower culture.] *Bol. Camara Agric. Nacion. Leon [Mexico]* 10⁴: 1-3. 1924.—This article discusses sunflower culture under Mexican conditions.—*John A. Stevenson.*

5040. SCHAEFER, ERNST. **Studien über einige Staudeneigenschaften der Kartoffelpflanze.** [Bush characteristics of potato plants.] *Jour. Landw.* 72: 163-195. 1924.—Ninety-four species were studied. Stem and leaf characteristics are fully described, as well as general bush characteristics. Many of the parts of the plant are correlated.—*F. M. Schertz.*

5041. SCHOWALTER, E., UND W. HARTMANN. **Über Kartoffeln mit hohem Solanin Gehalt und ihre Verwendung als Pflanzkartoffeln.** [Potatoes with high solanin-content and their use as seed-potatoes.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 47: 251-257. 1924.—Solanin content of potatoes (*Solanum tuberosum*) is found to increase in storage in the dark. Three experimental plantings of potatoes of high solanin-content yielded harvests of normal content.—*E. E. Stanford.*

5042. SHEPHERD, A. N. **Rice growing.** *Agric. Gaz. New South Wales* 35: 855-858. 1924.—Rice is grown according to the California method. Yields well over 100 bushels per acre were secured. Conditions generally favor the cultivation of rice.—*L. R. Waldron.*

5043. STANDLEY, P. C. **Notes on the cultivated plants of the Republic of Salvador.** *Gard. Chron.* III. 74: 88, 101, 118. *Fig. 35-36.* 1923.—Notes are given on climatic conditions, abundance of the flora as compared with other Central American countries, together with an enumeration of the principal cultivated plants and their uses.—*P. L. Ricker.*

5044. TENNENT, R. B., AND J. R. MARKS. **Irrigation and its practice.** VI. **Lucerne growing under irrigation.** *New Zealand Jour. Agric.* 29: 381-389. 1924.—This is a general discussion on the culture of lucerne under irrigation, covering preparation of the land, sowing the seed, inoculation, time of applying and amount of water to use, cutting and curing, pasture and cultivation. The soils of central Otago are said to be well suited to growing lucerne and usually do not need to be limed or artificially inoculated. Frequent cultivation is believed to be of great necessity to control the weeds and loosen the soils.—*H. L. Westover.*

5045. TONDERING, P. **El algodón. Instrucciones para su cultivo en Tucuman.** [Cotton. Instructions for its culture in Tucuman.] *Rev. Indust. y Agric. Tucuman* 13: 193-201. 5 *fig.* 1923.—The system of cotton culture recommended for Tucuman Province is outlined.—*John A. Stevenson.*

5046. WELTON, F. A., AND V. H. MORRIS. **Wheat yield and rainfall in Ohio.** *Jour. Amer. Soc. Agron.* 16: 731-749. 1924.—Statistical data indicate that a decrease in rainfall is accompanied by an increase in yield of wheat. In most years too much rainfall probably depresses wheat yields.—*F. M. Schertz.*

5047. WHITNEY, MILTON. **The yield of wheat in England during seven centuries.** *Science* 58: 320-324. 1923.—Reviews of several papers on the general methods of medieval agriculture from the open-field system to the development of the inclosure of open-field farms are given. The seeming depreciation of wheat yield in the 14th century as compared to the 13th was attributed largely by these writers to soil exhaustion. No yields are given by the political economists for the 15th, 16th and 17th centuries, but the author has constructed a graph representing roughly the yield of wheat in England during the 13th to 19th centuries, inclusive. The 13th century yield is given at 6 bushels and no significant change occurs until the 17th century when methods of agriculture began to improve. The graph shows an increase of 1 bushel in each 12½ years since 1650, the yield reaching approximately 32 bushels in 1900. Previous to the 16th century there was a small urban population and poor transportation facilities, but during the 16th and 17th centuries the industrial age began, the urban population increased, and the open-field farms gave way to the inclosed system where individual effort was rewarded. Better farming practice such as the introduction of clovers, drainage, rotations, fertilizers, etc., made for increased yields. The author believes that the low average yield of the medieval time was due to methods rather than the loss of any plant food from the farm, and that the increased yield of England today is due to the improved methods and the higher average of intelligence of the farmer. He does not believe that the limits of maximum yield have been reached, but raising the yield higher than at present has an economic aspect. The low average yield in the U. S. A. is attributed to the use of methods by a considerable proportion of our farmers, that give about the same return as that obtained under the English medieval system.—*J. W. Taylor.*

5048. WILLARD, REX E. **The agricultural regions of North Dakota.** *North Dakota Agric. Exp. Sta. Bull.* 183. 168 p. 64 fig. 1924.—A graphical treatment of the climatics of the state is presented. The percentage of land area in farms, percentage of farm area in crops, and percentage of crop areas in the standard crops—wheat, oats, barley, rye, flax, corn, potatoes, and tame hay—are presented in a graphical manner by means of maps. Statistical maps are given showing relative production of the standard crops by counties, individually and combined, and relative damage caused by drought, rust, and insects to certain crops, individually and combined. Curves are presented showing acreage and yield of the standard crops from 1890 to 1923, and the relation of the standard crops to each other. Tables are presented showing yields of crops for different counties, by years. Each county is given a brief climatic, soil, and crop statistical treatment.—*L. R. Waldron.*

5049. WILSON, JAMES G. **Seeds.** *Canterbury [New Zealand] Agric. Coll. Mag.* 4: 529-532. 1918.—The possibilities of growing the chief crop plants of New Zealand for seed are discussed.—*H. H. Allan.*

5050. WISE, F. B. **Statistics of the rice crop of the year 1923-1924.** *Rice Jour.* 27: 16-17. 1924.—The article shows in detail the production, distribution, consumption, carry-over, stocks, domestic exports, shipments to Porto Rico, Alaska and Hawaii, and imports and exports of foreign rice.—*L. Pace.*

5051. WOOD, HORATIO C. **Sugar.** *Amer. Jour. Pharm.* 96: 278-287. 1924.—This one of a series of popular lectures delivered at the Philadelphia College of Pharmacy and Science, discusses the history of sugar, its methods of production and lastly some notes in regard to sugar as a foodstuff.—*Anton Hogstad, Jr.*

SOIL SCIENCE (EDAPHOLOGY)

5052. ALBES, A., UND O. NOLTE. **Düngungsversuche mit Stickstoff zu Wiesen.** [Fertilizing experiments with nitrogen for meadows.] *Mitteil. Deutsch. Landw. Ges.* 40: 43-44. 1925.—This is a brief reply to Raum's argument to the effect that it does not pay to fertilize meadows. The authors give figures to show that it does.—*A. J. Pieters.*

5053. ALLISON, F. E. **The effect of cyanamid and related compounds on the number of microorganisms in soil.** *Jour. Agric. Res.* 28: 1159-1166. 1924.—The results of laboratory studies to determine the effect of applications of cyanamid and related compounds on bacterial numbers in soil are given. Cyanamid produced unusually large increases in the number of bacteria in soils, the maximum increase usually occurring within 2 weeks

after application, but this depended upon a number of factors, chiefly the rate of application and temperature of incubation. In 1 instance, the number reached was 70 times the control. In an attempt to determine the particular constituent in cyanamid primarily responsible for this rapid bacterial multiplication, it was found that both the cyanamid content and the lime were very important. Where used alone, either calcium hydroxid or calcium oxid in amounts equivalent to that found in cyanamid produced large increases in numbers. Within the limits of these experiments, the larger the application the larger was the stimulation. In the case of pure cyanamid (H_2CN_2) the 2 lower rates of application produced relatively small increases and the highest partially sterilized the soil. On the other hand, the intermediate rate produced a very large increase comparable to cyanamid. It is, therefore, impossible to state whether lime or cyanamid is the greater factor in explaining the effects of cyanamid. Undoubtedly, both are important in the moderate applications, but the cyanamid or its decomposition products are largely responsible for the partial sterilization with the higher applications. The enormous increases in numbers sometimes noted with certain concentrations of cyanamid can probably be attributed in large part to the cyanamid. The other materials studied, namely, urea, ammonium sulphate, dicyanodiamid, guanylurea sulphate, guanidin nitrate and biguanid nitrate did not greatly affect bacterial numbers.—*Author*.

5054. ALLISON, F. E. The nitrification of phosphorus nitride. *Jour. Agric. Res.* 28: 1117-1118. 1924.—A report is given of a laboratory experiment planned to determine if the nitrogen in phosphorus nitride is readily converted to nitrate nitrogen when applied to a soil maintained under optimum conditions for nitrification. Negative results were obtained, the conclusion being drawn that the nitrogen in phosphorus nitride is not readily converted into nitrates and that the compound would not, therefore, be suitable for use as a fertilizer.—*Author*.

5055. ANDERSON, M. S. The heat of wetting of soil colloids. *Jour. Agric. Res.* 28: 927-935. 1924.—The heats of wetting of soils and of colloidal materials isolated from soils are given. The colloidal soil materials vary widely in their heat of wetting and in some cases are comparable with the heat values for starch and for synthetic inorganic gels. Practically all the heat of wetting of a soil appears to be due to colloidal material. The colloid content of a soil can not be deduced from the heat of wetting of the soil alone but a fair approximation of the colloid content may be indicated by the formula:

$$\frac{\text{heat of wetting of soil}}{\text{heat of wetting of colloid}} \times 100.$$

Factors affecting the accuracy of the determination are discussed.—*Author*.

5056. BLANCK, E., UND F. ALTEN. Versuche mit Jauchedrill bei Hafer und über den aufschliessenden Einfluss der Jauche auf die Mineralbestandteile des Bodens. [Experiments on oats with a liquid manure drill and the influence of liquid manure on the liberation of the mineral constituents of the soil.] *Jour. Landw.* 72: 129-138. 1924.—Preliminary experiments indicate that urine has a liberating action upon the mineral constituents of the soil.—*F. M. Schertz*.

5057. BLANCK, E., UND F. ALTEN. Zur Wirkung des Zeotokols (Doleritmehls) auf die Pflanzenproduktion. [The action of "Zeotokols (Doleritmehls)" upon plant production.] *Jour. Landw.* 72: 145-152. 1924.—"Zeotokol" is a coarsely grained basaltic dolerite which is finely ground for use as a fertilizer. Pot experiments showed a slightly diminished yield by using "Zeotokol."—*F. M. Schertz*.

5058. BLANCK, E., UND F. ALTEN. Ein Beitrag zur Frage nach der Vorbehandlung der Böden mit Ammoniak für die Atterbergsche Schlämmanalyse. [The preliminary treatment of soils with ammonia for Atterberg's mechanical analysis.] *Jour. Landw.* 72: 153-162. 1924.—The authors do not recommend the preliminary treatment with NH_3 for all soils.—*F. M. Schertz*.

5059. CHILIAN NITRATE COMMITTEE, SYDNEY. Nitrate of soda for cane growing. How to use nitrate of soda profitably on growing sugar cane during November, December, January, and February. *Australian Sugar Jour.* 16: 613, 615. 1924.—Where soils are acid or slightly acid, nitrate of soda should be used, as it serves the dual purpose of nitrogen supplier and

acid neutralizer. On strongly alkaline soils and on those containing abundant supplies of lime, sulphate of ammonia could be recommended as a nitrogen supplier. As soon as practicable after a heavy rain the nitrate of soda should be distributed on the soil along the rows of growing cane, 140 pounds per acre being a convenient quantity to distribute, and 2-3 applications at intervals of 6-8 weeks under favorable conditions being highly beneficial.

—*Nellie E. Fealy.*

5060. COMBER, N. M. **The sourness of soils.** Rept. British Assoc. Adv. Sci. 1923: 495. [1924].—Sourness in soils is recognized from the agricultural point of view by the failure of certain plants and the dominance of others, the prevalence of certain diseases and a rectification of these conditions following the use of lime. The author holds that the cause of sourness is not the H-ion concentration nor the ratio of calcium to other metals. There is, however, evidence that the ratio of basic lime to weak bases, chiefly alumina, is the fundamental cause of sourness. The function of lime appears to be, (1) to act as a flocculent of the soil colloids and the root hair colloids and (2) to prevent too great an uptake of alumina and other toxic substances.—*T. D. Rice.*

5061. CONNER, S. D. **Some factors affecting the growth of crops on acid soils.** Indust. and Eng. Chem. 16: 173-175. 1924.—The author discusses the different kinds of soil acidity and the common methods for their determination. The Hopkins soil acidity method measures the mineral acidity. The Jones method measures the total quantity of acids, both organic and inorganic. The formula, $K = H^2 / J-H$ —the square of the mineral acidity divided by the organic acidity—gives an index which is a good indication of the lime needs of crops in either organic or inorganic acid soils. The toxicity of soil acids may be due to both aluminum-ions and hydrogen-ions. Some crops, corn and radishes, are more sensitive to aluminum-ions than to hydrogen-ions; others, red clover and beets, are more sensitive to hydrogen-ions than to aluminum-ions. Both phosphates and lime are needed to correct the toxicity of aluminum- and hydrogen-ions in most acid soils and it is believed that much of the benefit of phosphate on such soils is due to a correction of the aluminum toxicity.—*T. D. Rice.*

5062. HARTWELL, BURT L., AND F. R. PEMBER. **The effect in pot culture of green manure in different stages of growth and decomposition, on the subsequent crop.** Jour. Amer. Soc. Agron. 16: 750-753. 1924.

5063. HEINRICH, REINHOLD. **Dünger und düngen. Anleitung zur praktischen Verwendung von Stall- und Kunstdüngern.** [Fertilizers and fertilization. A guide to the practical use of stable and artificial manures.] 8th completely revised ed. Edited by OTTO NOLTE AND M. HEINRICH. viii + 174 p. Illus. P. Parey: Berlin, 1922.—The 1st part of this work gives a thorough discussion of the composition of stable manures. The 2nd part deals with the composition, source and preparation of the artificial fertilizers. In the 3rd part of the volume results are given of experiments to determine the influence of different fertilizers on the soil and on the yields of a number of crops.—*T. D. Rice.*

5064. JONES, J. S., AND W. W. YATES. **The problem of soil organic matter and nitrogen in dry-land agriculture.** Jour. Amer. Soc. Agron. 16: 721-731. 1924.—Nitrogen has been maintained on plats that have grown field peas continuously with crops removed, but organic matter is lower than in plats alternately cropped with winter wheat and summer fallowed.—*F. M. Schertz.*

5065. LIEROW, WALTER. **Beitrag zur Kenntniss der alkalischen Reaktion des Bodens und deren Wirkung auf die Pflanzen.** [The alkaline reaction of soil and its action on plants.] Bot. Archiv. 6: 457-465. 1924.—All fertilizers used had in the case of barley a more or less pronounced influence on plant yield, but in the case of oats only manganese fertilizing increased the yield beyond the experimental error.—*William Seifriz.*

5066. LIPMAN, J. G. **The value of sulphur in soil improvement and crop production.** Indust. and Eng. Chem. 16: 250-252. 1924.—The numerous uses of sulphur in agriculture are mentioned. Data are presented to show that commercial flour of sulphur ground to pass 200, 80 and 20-mesh sieves, respectively, is effective in the order of fineness given, in controlling potato scab. Better control of the scab was obtained where a commercial fertilizer was used in which the nitrogen was derived from ammonium sulphate. Sulphur di-

luted with an equal quantity of ground rock phosphate gives better results in the control of potato scab than the same quantity of sulphur without the phosphate rock. Yields of potatoes and other crops seem to indicate that sulphur may exert a stimulating effect after due allowance is made for increased production due to control of diseases. This effect may be due to the stimulation of the soil microbiological activities, particularly in the formation of nitrates and the fixation of atmospheric nitrogen induced by the application of sulphur to some soils and for some crops.—*T. D. Rice*.

5067. Q., H. **Trash as a soil builder.** (Cairns Post.) *Australian Sugar Jour.* 16: 465. 1924.—This is a discussion of a recent demonstration of a plow specially designed for trash plowing which has focused attention on the use of trash as a soil builder.—*Nellie E. Fealy*.

5068. ROSE, BOTHO VON. **Ein Beitrag zur Einwirkung der Düngesalze auf die Bodenreaktion und die Ertrag verschiedener Pflanzen.** [Effect of fertilizer salts on soil reaction and on the yield of various plants.] *Bot. Archiv.* 7: 112-133. 1924.—Physiologically acid fertilizing with ammonium sulphate produced in barley and mustard an increase in yield, and in buckwheat and beans a decrease. Alkaline fertilizing with calcium carbonate was detrimental to buckwheat. Alkaline fertilizing with nitrate of soda raised not only the absolute crop production but also the proportion of straw to grain to the advantage of the grain.—*William Seifriz*.

5069. TANSLEY, A. G. **Soil 'sourness' as an ecological factor.** (Abstract) *Rept. British Assoc. Adv. Sci.* 1923: 494. [1924].—In this abstract of a discussion of the influence of climatic and soil factors on vegetation, the various theories of the causes of soil acidity are mentioned and the conclusion is reached that it is a complex phenomenon.—*T. D. Rice*.

5070. TAYLOR, EDWARD MCKENZIE, AND C. B. WILLIAMS. **A comparison of sand and soil temperatures in Egypt.** *Egypt Dept. Agric. Tech. and Sci. Service Bull.* 40. 1-24. 1924.—This report outlines the results of experiments to determine the difference between the temperatures down to a depth of 30 cm. in an almost dry desert sand of uniform composition and a black agricultural soil which is irregular in composition and moisture content. Observations were taken simultaneously during a week in August and a week in March in 2 localities near Cairo. The maximum surface temperatures of the black soil in both August and March were about 8°C. higher than the sand, the minimum temperature of the black soil was a little above that of the sand in August and a little below it in March.—*T. D. Rice*.

5071. TAYLOR, WILLIAM. **Potash, potatoes and vines.** *Gard. Chron.* III. 75: 105. 1924.—Potash in the soil is regarded as a primary requisite for successful potato growth. Wood ashes have been regarded as excellent potash fertilizer but such ash is said to vary much as to its potash content, which is usually low in ash from wood grown in a potash-deficient soil. Liquid manure containing cow urine enabled plants to withstand hot weather much better without wilting. Text-books state that starch is not generated unless potash is present, and that an adequate supply of potash is essential to the full assimilation of carbon. Arrangements for the collection of urine and preventing the leaching of manure are urged. Kainit is said to contain too much common salt to be good for potatoes, and the sulphate of potash is suggested as the more desirable form.—*P. L. Ricker*.

5072. TEALE, E. O. **The physiography of the Meadows Valley, Mount Lofty Ranges.** *Trans. and Proc. Roy. Soc. South Australia* 46: 160-165. *Maps.* 1922.—The Meadows Valley appears to be a portion of an ancient north and south stream which existed before the uplift of the present highlands, and which perhaps ran through a still more ancient glacial valley partly filled with till.—*Wm. Randolph Taylor*.

5073. WINTERS, N. E. **Soil conditions which promote nitrogen fixation.** *Jour. Amer. Soc. Agron.* 16: 701-716. 1924.—In a high and in a low lime requirement soil, 1 ton of limestone per acre promoted N fixation about as much as heavier applications; 100 pounds of NaNO_3 , $(\text{NH}_4)_2\text{SO}_4$ or $\text{Ca}(\text{NO}_3)_2$ stimulated N fixation, but heavier applications depressed it. In the laboratory experiments reported, tests were made as to the effect of varying amounts of liming materials, gypsum, calcium silicate, fertilizer materials and several other factors which may influence N fixation in the soil.—*F. M. Schertz*.

5074. ZANDER, HANS. **Der Einfluss des Wassergehaltes und des Hohlraumvolumens auf die Bearbeitungsfähigkeit des Bodens.** [The influence of the water content and the pore

space on the working condition of soils.] Internat. Mitteil. Bodenkunde 10²⁻³: 89-117. 1920.—The author constructed a spade for his investigation which is carefully described. This spade was driven into soils of different textures and under different conditions of moisture and the work required for the penetration was carefully measured. Two principal series of investigations were conducted; one with varying water content and constant pore spaces, the other with varying pore space and a constant water content. The experiments show the practical agriculturist that the soil is in its optimum condition for easy tillage when it contains exactly the amount of water corresponding to its hygroscopic capacity.—*Franz Dühring*. (Adapted by T. D. Rice from German abstract.)

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

CARROLL W. DODGE, *Editor*

CHARLES A. WEATHERBY, *Assistant Editor*

(See also in this issue Entries 4977, 5023, 5047, 5051, 5217, 5237, 5400, 5552, 5756, 5759, 5780, 5785)

5075. ANONYMOUS. [Joseph Moeller.] Nature 114: 651. 1924.—The death of Joseph Moeller of the University of Vienna is noted. He taught at Vienna, Innsbruck and Graz, returning later to Vienna. Among his publications are: "Vergleichende Anatomie des Holzes," "Anatomie der Baumrinde," and "Mikroskopie der Nahrungs-und Genussmittel," the latter having been translated into several languages.—*O. A. Stevens*.

5076. ANONYMOUS. Josselyn Botanical Society. Maine Nat. 4: 109. 1924.—This is a report of the summer meeting of the Society, held at Ashland, Maine, July 14-19, 1924.—*C. A. Weatherby*.

5077. ANONYMOUS. Memorial to Sir Isaac Bayley Balfour. Gard. Chron. III. 74: 336. Fig. 120-122. 1923.—Fifty acres of land in Glenbranter forest have been set aside by the Forestry Commission, as a memorial to the late Regius Keeper of the Royal Botanical Garden at Edinburgh, to furnish the garden with testing grounds for western Chinese plants.—*P. L. Ricker*.

5078. ANONYMOUS. The growth of sugar production. Australian Sugar Jour. 16: 579, 581. 1924.—This statistical history shows the growth of the world's sugar production and the cyclical nature of the growth.—*Nellie E. Fealy*.

5079. ANONYMOUS. The Prime Minister's Queensland tour. Australian Sugar Jour. 16: 515-521, 523-527. 1924.—The account of the tour of S. M. Bruce contains some interesting fragments of history regarding agriculture in certain parts of Queensland, particularly the sugar industry.—*Nellie E. Fealy*.

5080. ANONYMOUS. The Royal Botanic Gardens, Kew. [Rev. of: HILL, A. W. The work of the Royal Botanic Gardens, Kew. Jour. Roy. Soc. Arts 72: 87-102. 1923.] Nature 113: 442. 1924.

5081. ANONYMOUS. The tercentenary of the Oxford Physic Garden. Gard. Chron. III. 73: 359. 1923.—This is a list of the speakers at the celebrations, with historical notes and a list of some of the more noteworthy plants.—*P. L. Ricker*.

5082. ANONYMOUS. The true sacred Egyptian lotus of the Nile. Missouri Bot. Gard. Bull. 11: 25-28. Pl. 5. 1923.—The writer concludes that either *Nymphaea Lotus* or *N. caerulea* deserves the above title.—*O. T. Wilson*.

5083. BIZIO, BARTOLOMEO. Letter to the most eminent priest, Angelo Bellani, concerning the phenomenon of the red-colored polenta. Translated from the Italian by C. P. MERLINO. Jour. Bact. 9: 527-543. 1924.—This letter first published in a Venetian journal [Biblioteca italiana o sia giorn. di Letteratura Scienze e Arti 30: 275-295. 1823] is of great interest to bacteriologists. The cause of the "bloody" polenta (corn meal mush) was shown to be a microscopic "plant" to which the binomial *Serratia marcesens* n. gen., n. sp. was given. Inoculation experiments on fresh polenta are the 1st cases on record of the use of solid culture media. Heat and moisture relationships, effect of antiseptics, chemical nature of the red pigment, and

other matters are discussed in a manner which is in no essential way different from reports of scientific experiments of the present day.—*C. E. Skinner.*

5084. BROTHERSTON, R. P. Loudon's second tour to Scotland. *Gard. Chron.* III. 74: 172. 1923.—Loudon made 3 journeys through England and part of Scotland. The 2nd started April 24, 1831, and lasted about 5 weeks. Numerous notes on plants are given on the trip, by both Loudon and his wife.—*P. L. Ricker.*

5085. BROTHERSTON, R. P. Puzzles in plant names. *Gard. Chron.* III. 73: 201. 1923.—Notes are given on the origin of some vernacular plant names.—*P. L. Ricker.*

5086. -C., H. G. [Richard Irwin Lynch.] *Nature* 114: 942. 1924.—Richard Irwin Lynch, curator of the University Botanic Garden at Cambridge for 40 years, died on December 7. He was born in 1850 and was best known for his book on *Iris* and for his *Cineraria* and *Gerbera* hybrids.—*O. A. Stevens.*

5087. CAMPBELL, DOUGLAS HOUGHTON. Wilhelm Pfeffer (1845-1920). *Proc. Amer. Acad. Arts and Sci.* 57: 499-502. 1922.

5088. CHRISTENSEN, HAROLD R. Referater af fremmed Litteratur. [References to foreign literature.] *Tidsskr. Landøkonomi* 5: 791-859. 1924.—A review of agricultural literature foreign to Denmark is given, including 8 pages of titles.—*Albert A. Hansen.*

5089. CLAY, REGINALD S. Some developments of the Hooke microscope. *Jour. Roy. Microsc. Soc. London* 1924: 357-364. 4 fig. 1924.—This is a description and discussion of Robert Hooke's microscope, and of the simplifications and improvements of Cocks, Helvelius, etc.—*Ralph E. Cleland.*

5090. COBURN, LOUISE H. Kate Furbish, botanist. *Maine Nat.* 4: 106-108. *Portrait.* 1924.—Miss Furbish celebrated her 90th birthday in May, 1924. She was born at Exeter, New Hampshire, but has lived nearly all her life at Brunswick, Maine. During many years she has collected in central Maine and has visited most other parts of the state. A species of the St. John Valley, *Pedicularis Furbishiae*, was named for her. In 1908 she presented her herbarium of about 4000 sheets to the New England Botanical Club. She has made water-color drawings from living specimens of nearly all the herbaceous plants of Maine except the grasses, sedges, and ferns; this series of drawings she has given to Bowdoin College.—*C. A. Weatherby.*

5091. COULTER, J. M. George Lincoln Goodale. *Bot. Gaz.* 77: 453. *Portrait.* 1924.—This is an appreciation of the pedagogical activity of Professor Goodale.—*B. W. Wells.*

5092. DRUCE, G. C. William Baxter, Curator of the Oxford Botanic Gardens and his correspondence. *Gard. Chron.* III. 75: 106, 120-121. 1924.

5093. GRIFFITH, IVOR. A half century of research in plant chemistry. A chronological record of the scientific contributions of Frederick Belding Power. *Amer. Jour. Pharm.* 96: 601-614. *Pl. 1. Portrait.* 1924.—This is a review of the activities of FREDERICK BELDING POWER, in which the author has listed the titles of some 127 papers by Power and the various awards tendered him in recognition of his phyto-chemical studies.—*Anton Hogstad, Jr.*

5094. JACKSON, CHARLES LORING. William Gilson Farlow (1844-1919). *Proc. Amer. Acad. Arts and Sci.* 57: 484-491. 1922.

5095. PRAIN, DAVID. History of the Oxford Botanic Garden. *Gard. Chron.* III. 74: 22-23. 1923.—This is an address delivered at the tercentenary celebration of the garden.—*P. L. Ricker.*

5096. ROBERTS, W. Dr. John Hall of Maidstone: botanist and poet. *Gard. Chron.* III. 75: 6. *Portrait on p. 2.* 1924.—The British Bibliographer for 1812 contains some verses on plant lore by Hall, that seem to have been generally overlooked. They are reproduced together with a brief sketch and picture of Dr. Hall.—*P. L. Ricker.*

5097. ROBERTS, W. An eighteenth century American seed list. *Gard. Chron.* III. 75: 92. 1924.—Notes are presented on the extensive list of seed sent to Lord Viscount Townshend about 1761-1762. Some of the most interesting are listed.—*P. L. Ricker.*

5098. ROBERTS, W. "The orchard and the garden." 1596. *Gard. Chron.* III. 73: 106. *Fig. 52-53.* 1923.—Notes are given on an earlier edition than any previously known, found in the Britewell Court Library, and purchased by Messrs. Quaritch.—*P. L. Ricker.*

5099. SAVAGE, S. The tercentenary of Gaspard Bauhin's "Pinax" 1623. *Gard. Chron.* III. 74: 40-41. 1923.—This work was the 1st attempt at a natural classification of plants, and

in it a distinct preference was shown for 2-word names of plants. Bauhin, born in 1560, was of a family of physicians that flourished in France and Switzerland for over 2 centuries. A copy of the 2nd edition of the "Pinax" (1671) now in the library of the Linnaean Society of London was the property of Linnaeus and is properly annotated by him with plant names that he adopted. A brother, Jean Bauhin, was also a well known botanist. The genus *Bauhinia* was dedicated to them by Linnaeus.—*P. L. Ricker*.

5100. TRAVERSO, G. B. (Editor) *Scritti scelti Cuboniani*. [Selected papers of Cuboni.] xxx + 241 p. *Portrait*. Premiata Tipografia: Pavia, 1924.—A 25-page biography of Giuseppe Cuboni (1852–1920) and an appreciation of his work and influence by the editor is followed by a reprinting of 17 of his papers of general biological and philosophical interest.—*C. W. Dodge*.

5101. VATER, F. *Nobbe und die pflanzenphysiologisches Versuchs- und Samenkontroll Station zu Tharandt*. [F. Nobbe and the research station at Tharandt for plant physiology and seed control.] *Tharandter Forst. Jahrb.* 75: 141–188. 1924.—This is a critical biographical notice with a list of F. NOBBE's publications.—*K. W. Woodward*.

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 5115, 5188, 5216, 5356, 5357, 5787, 5789, 5981, 6003)

5102. ANONYMOUS. *Gathering flowers for the show*. *Missouri Bot. Gard. Bull.* 11: 68–70. 1923.—Suggestions are offered for increasing the keeping qualities of various flowers.—*O. T. Wilson*.

5103. ANONYMOUS. *Work of vocational students*. *Missouri Bot. Gard. Bull.* 11: 59–61. *Pl. 13*. 1923.

5104. ANONYMOUS. [Rev. of: GILBERT-CARTER, HUMPHREY. *Descriptive labels for botanic gardens*. 80 p. University Press; Cambridge, 1924.] *Nature* 114: 748. 1924.

5105. CLUTE, WILLARD N. *The meaning of plant names*.—XXII. *Solanaceae*. *Amer. Bot.* [Joliet, Illinois] 31: 8–16. 1925.

5106. DOWNING, ELLIOT R. *Some radical departures on the teaching of biology*. *Trans. Illinois State Acad. Sci.* 17: 75–77. 1924. [1925].—"All subject-matter should be eliminated from the course that is not socially worth while and at the same time of prime interest to the pupils." Pupils are interested primarily in the activities of animals and plants, their identification and their relation to the environment. The subject-matter should be organized in relatively small units. Many of these units should be organized in problem or project form. Some units should be organized to give aesthetic appreciation of one's environment. Recent experiments of educators have shown that the lecture demonstration is more effective than the laboratory method of instruction and much more economical of time and material. "Bar the compound microscope from the High School biology course . . . omit all dissections by students."—*H. W. Anderson*.

5107. ENGLER, A. (Editor.) *Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten insbesondere den Nutzpflanzen unter Mitwirkung zahlreicher hervorragender Fachgelehrten begründet von A. Engler und K. Prantl*. 10. Band. *Musci* (Laubmoose) 1. Hälfte. [The natural families of plants, together with their genera and more important species, especially those of economic value, established by A. Engler and K. Prantl with the collaboration of numerous distinguished specialists. 2nd. ed., much enlarged and improved. Vol. 10. *Musci* (mosses), 1st half.] 8 vo. iv + 478 p. Fig. 1–420. Wilhelm Engelmann; Leipzig, 1924.—The 2nd edition of this extensive work founded by A. ENGLER and K. PRANTL will follow the plan of the 1st, but will bring the subject matter up to date. Each group of plants will be treated by one or more specialists, and the following topics will first be considered: the important literature of the group, the distinctive features, the vegetative and reproductive organs, the geographical distribution, the occurrence as fossils, the systematic relationships, and the economic uses. The group will then be discussed from a taxonomic standpoint, full descriptions of the genera and more important species being given,

together with keys for their determination. It is planned to publish the work in 27 volumes, 1-8 being devoted to the Thallophytes, 9-11 to the Bryophytes, 12 to the Pteridophytes, and 13-26 to the Spermatophytes; the concluding volume will contain an index to the entire series. The contents of the present volume, the 1st to be issued, are abstracted under the authors of the various parts.—*A. W. Evans.*

5108. HOWELLS, DAVID D. *The nuptials of the flowers.* Florida Fruits and Flowers 1st: 126-128. 1924.—This is an article of a popular botanical nature describing the nature and sexes of flowers; the role of wind, insects and birds in effecting their pollination; and of the ways in which flowers are designed for securing cross-pollination.—*Arthur S. Rhoads.*

5109. PATTEN, WILLIAM. *Why I teach evolution.* Sci. Monthly 19: 635-649. 1924.

5110. TSOU, P. W., H. H. HU, AND S. S. CHIEN. [Advanced botany.] (Chinese.) 462 p. Pl. 1-306. Commercial Press: Shanghai, 1923.—This textbook is intended primarily for the use of college students, and its subject matter is mostly abstracted from the following English botanical publications: GANONG's Textbook of botany for colleges; COULTER, BARNES AND COWLES's Textbook of botany; COULTER's Elementary studies of botany; STEVEN's Plant anatomy; BERGEN AND CALDWELL's Practical botany; STRASBURGER's Textbook of botany; SCOTT's Evolution of plants; and VON WETTSTEIN's Handbook of systematic botany. The book is divided into 2 parts. The 1st part is devoted to plant structures, reproduction, physiology, and evolution; the 2nd part to chapters on representative plant groups including their economic aspects. A glossary of English botanical terms with Chinese translations is also appended.—*Chunjen C. Chen.*

5111. TU, YA TSUAN, AND EDITORIAL STAFF. *Botanical nomenclature.* (Chinese.) 1590 p. 1000 fig. Commercial Press: Shanghai, 1918.—This is a complete dictionary of botanical terms arranged according to the number of strokes of Chinese characters. An English and a Japanese index are also included.—*Chunjen C. Chen.*

5112. YUAN, SUNG CHOU. [Chinese agricultural products.] (Chinese.) 407 p. Pl. 1-124. Commercial Press: Shanghai, 1924.—This book is designed either as a textbook, or as a general reference book on farm crops for the use of agricultural colleges and schools in China. There are altogether 40 chapters in which the following subject matters are treated: general classification; rotation; rice culture; upland rice; wheat and wheat culture; barley; oats; common millets; broom corn millet; sawa millet; corn and corn culture; kowliang; rye, buckwheat; legumes; sweet potatoes; Irish potatoes; fiber plants; description of cotton plant; origin, use, and world production of cotton; varieties and improvement of cotton; soil and climatic requirements of cotton; cotton culture; hemp; ramie, abutilon, and jute; flax; peanuts; sesame; rape; Chinese wood-oil tree; castor oil plant; sugar cane; sugar beet; tobacco production; tea; indigo plants.—*Chunjen C. Chen.*

CYTOLOGY

GILBERT M. SMITH, *Editor*

(See also in this issue Entries 5256, 5257, 5258, 5262, 5264, 5282, 5283, 5295, 5300, 5302, 5304, 5312, 5317, 5320, 5325, 5326, 5334, 5336, 5344, 5346, 5349, 5419, 5436, 5441, 5499, 5500, 5510, 5530, 5548, 5642, 5646, 5666, 5687, 5834, 5887, 5888, 5896)

5113. BELLING, JOHN. Detachment (elimination) of chromosomes in *Cypripedium acaule*. Bot. Gaz. 78: 458-460. Fig. 1-2. 1924.—Three plants of *Cypripedium acaule* were moved to a cold frame in fall and transferred to a greenhouse early in spring. Anthers of these examined later in the spring were found to show cases of detachment of chromosomes which were apparently due to the sudden change to warmth and the hastening of the flowering. One anther of a plant contained pollen grains with only 1 nucleus, another anther of the same plant showed grains with 2 nuclei. While 10 V-shaped chromosomes should occur, groups of cells were observed in which 8 or 10 cells had this number and 1 of the group had only 9 short chromosomes. The relative abundance of the 9-chromosome condition may be due to the fact that these microspores were either longer in completing division than those with the full number of 10, or did not complete their division at all.—*Wanda Weniger.*

5114. CHODAT, R. *La caryocinèse et la réduction chromatique observées sur le vivant.* [Caryocinesis and chromatin reduction observed *in vivo*.] *Compt. Rend. Séances Soc. Physique et Hist. Nat. Genève* 41: 96-99. 1924.—In 1922, using the orchid, *Gymnadenia conopsea*, the author followed caryokinesis in the megasporange and at the same time observed the chromatic reduction with formation of gemmi, which had not hitherto been done *in vivo*. These studies he has recently repeated and with like results. The orchid is gathered before pollination and allowed to expand in the laboratory. The nucellus has a tetrasporange which is formed from the last cell of an axial pluricellular archesporium composed of superposed cells in a single series. This mother-cell of the embryo sac is visible because of the transparency of the wall of the nucellus which is composed of a single layer. Before prophase this mother-cell contains a large nucleus which is hyaline and highly refractive, and only by oblique illumination shows the internal reticulate structure. At a more advanced stage the winding leptotene appears, replaced later by the pachytene which rapidly gives way in the interior of the nucleus to short, thick corpuscles which can only be interpreted as the gemmi. During this time the nucleole becomes slightly amoeboid, the nucleus becomes lobed and lengthened in a traverse direction. Ovules of later stages are found with nuclear membrane gone, and in the ellipsoid nuclear area one may then see in the equatorial plate the gemmi which are subrectangular, a little elongated in the polar direction, or with the characteristic cross-shape of the monocotyledons. Finally, the chromosomes separate into 2 groups which are more or less in the form of a V. The anaphases were also followed by the author. He believes his observations of further interest in showing that the cause of the formation of the visible spindle lies in an alteration of the colloidal state of the protoplasm.—*Frederick V. Rand.*

5115. DENHAM, HUMPHREY JOHN. *An introduction to cytology with special reference to the cotton plant.* (British Cotton Indust. Res. Assoc.) *Jour. Textile Inst.* 15: T 464-473. 2 pl. 1924.—This is an introductory paper to the author's studies of "The cytology of the cotton plant." It comprises "a brief and simplified account of the meaning and purpose of cytology" and outlines "diagrammatically the more important phenomena dealt with and the main interpretations of these in current use; the various points at which the processes of the cotton plant differ from the normal" are also briefly noted.—*Frederick V. Rand.*

5116. DENHAM, HUMPHREY JOHN. *The cytology of the cotton plant. I. Microspore formation in Sea Island cotton.* (British Cotton Indust. Res. Assoc.) *Jour. Textile Inst.* 15: T 474-495. Pl. 1-8. 1924.—(See also Bot. Absts. 14, Entry 3268.)

5117. DENHAM, HUMPHREY JOHN. *The cytology of the cotton plant. II. Chromosome numbers of old and new world cottons.* (British Cotton Indust. Res. Assoc.) *Jour. Textile Inst.* 15: T 496-500. Fig. 1-11. 1924.—(See also Bot. Absts. 14, Entry 3269.)

5118. ELLIS, DAVID. *An investigation into the structure and life history of the sulphur bacteria.* *Proc. Roy. Soc. Edinburgh* 44: 153-167. Fig. 1-9. 1924.—Investigation of *Beggiatoa alba*, found in landlocked marshes and seacoasts of western Scotland, shows that the cell is limited by a definite membrane which is inseparable from the cytoplasm. The cell membrane disorganizes to form a mucilaginous mantle which hardens to form a sheath that remains rigid until late stages of autolysis, where it is easily distinguished from the cell membrane. In stained material the protoplasm has a reticulate appearance containing sulphur globules enclosed in vacuoles which they do not entirely fill (suggestive of their formation by secretion from the protoplasm) and small granules of a solid consistency, considered to be nutritive in character. These granules are much more numerous in young filaments. No nucleus was demonstrable. Reproduction by transverse fission occurs only in young filaments and then without accompanying transverse septa. Periodic appearance and disappearance of cultures suggested some form of reproductive body. These are thought to have been found and are similar to endospores of other bacteria. A most noteworthy feature of the life history is the abrupt and characteristic disappearance of cultures following disturbed equilibrium of environmental conditions. This is manifested in transverse segmentation of the filament followed by formation of transverse septa of sheath material and ultimate expansion of the cells in orderly succession until they are completely dissolved. This process is considered a response on the part of the organism to loss of balanced conditions of oxygen and food. The swelling antecedent to final dissolution is due to the production of osmotically

active substances in the cell, together with lowered rigidity of cell membrane and weakened cytoplasmic mass, and not to the formation and activity of autolytic enzymes in the dying cells.—*Ray C. Friesner.*

5119. FERGUSON, NESTA. A preliminary account of a survey of the chromosomes of the *Liliaceae*. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 489. [1924].

5120. GATES, R. RUGGLES. Cell-wall formation. *Nature* 114: 788-789. 1924.—This is a preliminary report on investigations of pollen mother-cells of *Lathraea* in which the author finds essential differences between the process of furrowing in them and in animal cells.—*O. A. Stevens.*

5121. HADLEY, PHILIP. A method of staining lytic areas produced by the bacteriophage. *Jour. Bact.* 9: 405-408. 1924.

5122. IKARI, JIRO. On the nuclear and cell division of a plankton-diatom *Coscinodiscus subbuliens* Jörgensen. *Bot. Mag. Tōkyō* 37: 96-108. 2 pl., 2 fig. 1923.—The division of the chromatophore takes place almost always before the nuclear division, and then the pyrenoid within it is divided before the chromatophore itself.—One of the most remarkable facts about the nuclear division is the migration of the nucleus just before this process; the latter, which lies usually at the centre of the epitheca, begins to move toward the girdle side, and on reaching the valvar margin it travels to the hoop where it takes a new position almost in contact with the cell-wall. Soon afterwards spireme threads are formed, and the latter develop into a number of slender chromosomes (12-20). The central spindle then appears near the nucleus, gradually gets into the nuclear cavity through its membrane, and the nuclear division is completed. No true centrosome was found, so the author was not able to establish the centrosome origin of the central spindle, as was the case in some diatoms, according to the well-known observations of Lauterborn and Karsten.—*Author.* (Courtesy *Japanese Jour. Bot.*)

5123. KOMURO, HIDEO. Cytological and physiological changes in *Vicia Faba* irradiated with Röntgen rays. *Bot. Gaz.* 77: 446-452. Fig. 1. 1924.—A preliminary paper dealing with the effect of Röntgen rays on the cells of *Vicia Faba*. Seedlings in water were placed under the X-ray bulb and were irradiated with a current of 2.0-2.5 milliamperes for 1 hour. After 1½ hours of irradiation, mitoses seemed to be abnormal, all the other characters of the cell normal. After 6 hours, the nuclear membranes degenerated and abnormal binucleate cells were present. After 9 hours, degeneration of the nuclear membrane and deformation of the nucleus were frequently observed, and numerous binucleate cells were present. Seed exposed to 2 hours of irradiation germinated normally. Intermittent irradiation for 2 hours produced a malformed and necrotic condition.—*L. J. Pessin.*

5124. KOMURO, HIDEO. Über die abnormale Kernteilung in den Wurzelspitzen von *Vicia faba*. [Abnormal nuclear division in root tips of *Vicia faba*.] *Bot. Mag. Tōkyō* 38: 115-117. 1924.—This abnormal division process in the cells of the central cylinder was found to begin with division of the nucleolus into 2, followed by development of a division wall across the nucleus dividing it into 2 daughter nuclei without previous chromosome differentiation. This seems to be the type of division observed in the epithelial cells of the bladder, a type usually considered as a sign of degeneration.—*Frederick V. Rand.*

5125. LAUGHLIN, H. H. Duration of the several mitotic stages in the dividing root-tip cells of the common onion. *Carnegie Inst. Washington Publ.* 265. 48 p. 19 charts. 1919.—This paper presents a statistical method whereby the average relative and absolute duration of the several stages in the process of mitosis may be determined from samples of tissue taken periodically and prepared according to the usual histological methods. Material investigated is kept under normal conditions until the instant of fixing and large numbers of cells may be studied simultaneously. The average relative duration of a stage is determined from its stage index, that is, the fraction of the entire number of mitotically active cells that is represented by the cells in the given phase. Mitosis proceeds in "waves;" there are periodic spurts of mitotic activity. From actual counts made on periodically taken samples, index values are mathematically derived, by which the progress of each wave may be followed and the duration of any stage fixed.—A statistical study of the mitotic stages in the root of onion (*Allium cepa*) is presented, for maintained temperatures of 10, 20 and 30°C. Samples were taken every 10

minutes during an interval of 3 hours, and 1000 cells in each sample (19,000 in all for each temperature) were classified among 10 more or less arbitrarily chosen stages. The acceleration coefficient, Q_{10} , for the entire cycle was found to be 1.214 for the 10-degree interval from 10 to 20°, and 2.632 for the interval from 20 to 30°. Individual stages showed temperature coefficient values of 0.855-2.960 for the lower, and 1.153-4.941 for the higher interval. The proportion of cells undergoing mitosis (mitotic index) was 0.285 for 10° and 0.636 for 30°.—*A. F. Skutch.*

5126. LLOYD, F. E. **Fluorescence in the Cyanophyceae.** *Proc. and Trans. Roy. Soc. Canada Ser. 3*, 17: 129-136. 1924.—Various preparations of chlorophyll in colloidal form are fluorescent, when observed by means of the ultra microscope (dark field condenser). The difficulty of observing the fluorescence of chlorophyll in the leaf is due to the masking effect of reflected light from interfaces. When the cone of illumination from the dark field condenser is reflected from the cover-glass (glass: air interface) all the species of Cyanophyceae examined were highly fluorescent. This optical arrangement fulfils the conditions for observing fluorescence in general. When examined thus, some species appear deep carmine red, others appear brownish, while green algae with exactly the same treatment yielded no visible fluorescence. This contrast indicates that the physical system holding the water-soluble fluorescent pigments has optically different qualities from that containing chlorophyll. Evidence was found that the water-soluble pigment of the Cyanophyceae is contained in minute vacuoles, the interfaces of which reflect very little light. Hence the fluorescence of this pigment is much less masked than is that of chlorophyll in the chloroplast. The method of using the darkfield to obtain the above results is new.—*Author.*

5127. LUDFORD, REGINALD J. **Experiments on the impregnation of the Golgi apparatus by means of osmium tetroxide.** *Jour. Roy. Microsc. Soc. London* 1924: 269-280. *Pl. 17, 3 fig.* 1924.—A study was made of the effect upon cells of the use of various modifications of the Kopsch osmic acid method of demonstrating the Golgi apparatus in minute portions of transplantable tumors, especially malignant growths. The experiments show that "there exists in the cytoplasm of cells a certain region which brings about the reduction of osmic tetroxide at a lower temperature, or in a shorter time, than is required to produce a total blackening of the cells. This area is the so-called Golgi apparatus." Its appearance changes with progressive treatment of the cells with osmic acid, and the problem as to which stage in this sequence is representative of the morphological structure existent in the living cell is left unsolved. The reason for the non-appearance of the apparatus in fixed material of actively growing cells in tissue cultures, or in superficial cells in bits of fixed tissues, is also unexplained. Its appearance in the cells after the coagulating effect of fixation may bear little relation to its actual structure in the living cell. The importance of this specialized area within the colloidal mechanism of the cell, in development and metabolism, is emphasized.—*Ralph E. Cleland.*

5128. MCPHEE, HUGH C. **Meiotic cytokinesis of Cannabis.** *Bot. Gaz.* 78: 335-341. *Pl. 7.* 1924.—Although the pollen grains of *Cannabis sativa* are of variable sizes, no reason for these differences has been found in the studies reported. The haploid number of chromosomes is 10. The reduction division commonly occurs during the period from sunrise to noon. The behavior of the chromosomes is normal and there is no morphological evidence that any 1 of the 10 is a sex chromosome. Cytokinesis is by furrowing in this species.—*Wanda Weniger.*

5129. MERTON, HUGO. **Lebenduntersuchungen an den Zwitterdrüsen der Lungenschnecken.** *Ein Beitrag zur Protoplasma- und Spermienbewegung.* [Researches upon the ovotestes of air breathing snails in the living state. A contribution to the subject of protoplasmic movement and the movement of spermatozoa.] *Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre* 1: 671-686. 1 *pl.*, 8 *fig.* 1924.—Results are based largely upon examination of living cells in the ovotestes of *Planorbis planorbis*. Basal cells (nurse cells) were set free in various stages by tearing open the ovotestis in a weakened Ringer's solution. The ectoplasm of the basal cell has a distinct power of movement, forming blunt projections, or "lobopodia." If a lobopodium is cut off from a cell, it is found to retain its power of movement, and travels, but always with the same end forward, showing that it has a definite polarity. The ectoplasm is thus considered to be kinoplasmic in nature. The endoplasm of the basal cell comes to

possess, apparently by division, a number of prominent kinoplasmic granules. These are equal in number to the number of spermatozoa developed in contact with the basal cell. When the spermatozoa are fully formed, they lie stiff and straight, with their heads buried in the ectoplasm of the basal cell and their flagella radiating outward. The each kinoplasmic granule breaks away from the endoplasm, moves to the head of a spermatozoon and travels distally along the flagellum all the way to the end. The result of this process is that the spermatozoon acquires the power of movement. Thus there is both ectoplasmic and endoplasmic kinoplasm, and each kind, when separated from the basal cell, either naturally or artificially, shows a definite polarity of movement.—*Ralph E. Cleland.*

5130. MOULIN, F. DE. Über die Struktur des Zellprotoplasmas. [Structure of the cell protoplasm.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 507-516. 1924.

5131. PETERSCHILKA, F. Über die Kernteilung und die Vielkernigkeit und über die Beziehungen zwischen Epiphytismus und Kernzahl bei *Rhizoclonium hieroglyphicum* Kütz. Zur Cytologie der Chlorophyten III. [Nuclear division, multinuclearity, and the relation between epiphytism and number of nuclei in *Rhizoclonium hieroglyphicum*. Cytology of the Chlorophyceae III.] Arch. Protistenk. 47: 325-349. Pl. 13, 5 fig. 1924.—Nuclear division in this species of the Cladophoraceae is in general normal, with intact nuclear membrane, polar fields in the nucleus, and about 30 chromosomes. The nuclei are quite regularly distributed on the inner side of the chlorophores. The number of nuclei is somewhat variable up to 19 or 24, although there are uninucleate forms. This alga serves as host to certain epiphytes, bacteria, some small blue-green algae, and the diatom, *Cocconeis pediculus*. Epiphytism has great influence on the cells, changing the relation between nuclear number and cell division.—*Harold Kirby.*

5132. PRIESTLEY, J. H. The cell wall and the external medium. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 495. [1924].

5133. PRINGSHEIM, E. G. Beiträge zur Kenntnis der Festigungseinrichtungen bei *Chorda filum*. [Contribution to a knowledge of the contrivances for firmness in *Chorda filum*.] Arch. Protistenk. 47: 308-317. 14 fig. 1924.—Microscopic observation of a section of the thallus shows that the long, wide cells of the central body are striated obliquely, and between these striations are chink-formed dots. These striations cross at nearly a right angle. The dots represent openings in the cell wall, closed by a membrane, with nearly right-angled sides. There may be a difference in size and direction of the inner and outer openings, producing the crossing as seen from above. The oblique striations are not due to fibrils, but to thickening of the cell walls. It is evident from observations on sections produced in various ways that the striations are optically perceptible because of the undulating course of the surface of the innermost layer. This is a new type of membrane structure in algae.—*Harold Kirby.*

5134. ROBYNS, WALTER. Le fuseau de caryocinèse et le fuseau de cytokinèse dans les divisions somatiques des phanérogames. (Première partie). [The karyokinetic spindle and the cytokinetic spindle in the somatic divisions of phanerogams. (First part).] Cellule 34: 367-454. 5 pl. 1924.—A study was made of the origin of the karyokinetic spindle in root tips, chiefly of *Vicia faba* and *Hyacinthus orientalis*. Benda's mitochondrial method is found to preserve the structures in the most nearly natural state.—The interphase nucleus consists of the reticulate chromosomes whose surfaces constitute the nuclear boundary. A fluid taken up by the chromosomes in the preceding telophase is disengaged from them during early prophase and becomes the karyolymph. Where the newly formed karyolymph between the chromosomes touches the cytoplasm it is limited by a membrane which then forms a portion of the nuclear surface. As the karyolymph becomes diluted by a fluid added by the cytoplasm the nucleus enlarges. When the chromosomes are in the thick double spireme stage they, together with the nuclear membrane, contract as a "chromosomic pouch" away from the 2 poles of the "nucleoplasmatic cavity," leaving behind 2 polar caps of hyaline karyolymph, which pass through the retreating membrane apparently by a process of filtration. Topographically and in origin, the caps are thus nuclear although they lie between the nuclear membrane and the cytoplasm. The cytoplasm with its chondriosomes is separated from the caps by no membrane, but it contributes no formed element to the developing figure. As

the chromosomic pouch shrinks, the caps become correspondingly enlarged, and eventually they constitute the spindle cones. The membrane around the pouch finally disappears, and the chromosomes become equatorially arranged in the spindle substance. During the anaphase, in well fixed material, the region between the separating chromosome groups is devoid of fibrous differentiations. The subsequent behavior of the achromatic figure in cytokinesis is to be described in the forthcoming 2nd part of the memoir.—It is concluded that the spindle figure is wholly of nuclear origin, and that it is essentially a mass of homogeneous colloidal karyolymph; fibers or lamellae appearing at any stage are to be attributed to improper fixation.—*L. W. Sharp.*

5135. SPEK, JOSEF. *Neue Beiträge zum Problem der Plasmastrukturen.* [New contributions to the problem of protoplasm structure.] *Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- und Gewebelehre* 1: 278-326. 1924.—The structure of protoplasm was studied in various Protozoa by dark-field observation and by the "salt physiological" method. The organisms used were the fresh-water genera, *Actinosphaerium*, *Amoeba*, *Stentor*, *Vorticella*, *Paramecium* and *Colpidium*; the parasitic genus *Opalina*; and the marine genus *Tillina*. The "salt physiological" method consists in observing changes in the cytoplasm which occur when the living organisms are transferred to certain solutions, such as 0.01 M sodium sulphate. The changes, which are intensified when proteins are added, consist in the visible formation of large vacuoles. These are considered mere enlargements of some of the elements constituting the disperse phase of the emulsion already present, and not, as others suppose, a disintegration of the partitions in the emulsion. This is caused by increased surface tension in the partitioning substance or continuous phase. The author was unable to observe any accompanying increase in cell size; the enlarged vesicles in the protoplasm disappeared gradually upon return to the normal medium, but not by diminution of the vesicular size. The observations lead to the view that the protoplasms of Protozoa consist of 2 water phases which differ in density, and which do not show phase reversal. The optical differentiation into 2 phases is probably not due to lipoids but to proteins, and the maintenance of phase-heterogeneity may be the basis of characteristic vital activities.—*E. F. Adolph.*

5136. TAYLOR, WM. RANDOLPH. *The smear method for plant cytology.* *Bot. Gaz.* 78: 236-238. 1924.—The anthers are crushed and the contents spread over the center of a clean slide, using a flat scalpel for spreading. The slides are at once inverted in a fixing mixture in a Petri dish. The fixing mixture has the following composition: 10% acetic acid, 2 cc.; 10% chromic acid, 2 cc.; osmic acid dissolved to 2% strength in a 2% solution of chromic acid, 1.5 cc.; distilled water 8.3 cc. To this mixture is added about 1% of maltose. After a few moments immersion in this fixative in the inverted position, the slide is removed and flooded with the fixative for 15 minutes. It is then washed, bleached in dilute aqueous H_2O_2 , again washed, and stained by the iron-alum haematoxylin method and mounted in balsam. Passable results have been secured in 1 working day, thus enabling chromosome count work to be done very rapidly, and, since one is working with entire cells, there are no broken or cut chromosomes.—*I. V. Shunk.*

5137. TERBY, JEANNE. *Étude d'un cas de caryocinèse irrégulière dans le rhizome du Butomus umbellatus.* [A case of irregular karyokinesis in the rhizome of *Butomus umbellatus*.] *Bull. Soc. Roy. Bot. Belgique* 56: 42-47. *Fig. 1-12.* 1923.—The following 3 different nuclear phenomena were found by the author in *Butomus umbellatus*. (1) Cells with nuclei constricted; this may simply indicate degeneration and at least has no relation to (2) & (3).—(2) Cells with abortive karyokinesis; here the cell contents are so largely vacuolated that the new cell wall is unable to form completely across the cell.—(3) Binucleate cells which are considered to result from this abortive karyokinesis. Many of these cases have hitherto been considered as due to amitosis, but the formation of a partial wall at the center of the spindle negatives this older view. These phenomena are to be sought in aquatic plants where the vacuoles are always large.—*Frederick V. Rand.*

ECOLOGY

GEO. D. FULLER, *Editor*

(See also in this issue Entries 5016, 5069, 5108, 5216, 5240, 5243, 5351, 5427, 5430, 5439, 5441, 5450, 5451, 5457, 5464, 5487, 5488, 5489, 5504, 5531, 5535, 5537, 5538, 5547, 5552, 5565, 5605, 5607, 5862, 5938, 5939, 5973, 6008)

GENERAL, FACTORS, MEASUREMENTS

5138. DÉGEN, A. VON, JUL. GÁYER, UND J. SCHEFFER. *Magyar láptanulmányok*. [Studies of Hungarian moors. Magyar Bot. Lapok 22: 1-116. 1923 [1924].—After an introduction by Degen this contains the description of the flora of Detreköcsütörtöker Moor and the eastern portion of the Marchfeld. From these studies it appears that there are in this plain at an altitude of 150-200 m. very interesting bogs and raised bogs (Nieder- und Hochmoore) which consist partly of old bogs formed by the filling in of lakes and partly of younger bogs formed after reforestation and showing the stages of (1) accumulation of moisture, (2) colonization by *Sphagnum* and, (3) colonization by other bog elements. Between the bogs are sand dunes and slopes covered by fir forests. In Part II, the authors list the Characeae, the Lichenes and the Bryophyta. The following are described as new: *Urtica dioica* var. *subinermis* f. *pseudokioricensis*, *Cerastium caespitosum* var. *pinetorum*, *Rubus macrophyllus* W. N. **Schefferi* Gay., *Thymus lineatus* f. *tardus* Lyka f. *posoniensis* Degen.—I. Györfy.

5139. FORREST, GEORGE. *Rhododendrons of 1921 and 1922 and some trees and shrubs of Yunnan*. Rhododendron Soc. Notes 2*: 147-158. 1923 [1924].—The author gives an account of his travels in Yunnan during 1921 and 1922 and mentions and describes briefly the Rhododendrons and the more important species of the other trees and shrubs observed.—*Alfred Rehder*.

5140. FRÖDIN, JOHN. *La limite forestière en Scandinavie encore une fois*. [The Scandinavian timberline again.] Bot. Notiser 1921: 237-255. 1921.—This consists of a reply to the criticisms of Tengwall (see Bot. Absts. 14, Entry 3309) and the presentation of further evidence that the timberline is here modified by the character of the soil through its water and mineral content. This modification is quite independent of the influence of temperature, exposure and aspect.—*Geo. D. Fuller*.

5141. FULLER, GEORGE D., AND C. J. TELFORD. *Some north and south stream valleys in Illinois and their vegetation*. Trans. Illinois State Acad. Sci. 17: 94-99. 4 fig. 1924 [1925].—The stream valleys display soils characterized as timber soils consisting of yellow gray silt loam or upland timber soil in contrast to the brown or black silt loam of the level upland prairie. It has been observed that the strip of the timber soil on the east side of north and south streams is almost always wider than that on the west side. The usual explanation for the narrower strip on the west side is that prairie fires in their advance, driven by the prevailing westerly winds, make greater inroads upon the western edge of the forest than upon the eastern. A study of a number of valleys of north and south streams in Illinois indicated that this theory was untenable and the explanation is given that the wind borne soil material transported by the prevailing westerlies has been continually sifting in upon the western slopes and tending to fill up the western half of the stream valleys. This has at one and the same time checked erosion and caused the grassland to tend to invade the woodland.—*H. W. Anderson*.

5142. ISING, E. H. *Ecological notes on South Australian plants*. Trans. and Proc. Roy. Soc. South Australia 46: 583-606. Pl. 38-42. 1922.—These notes are the result of a trip taken along the transcontinental line between Hughes and Kingoonya during the period September 5 to 24, 1920. Unusually heavy rainfall had produced a specially luxuriant vegetation. The vegetation of the Nullarbor Plain shows on the Little Plain shrubs and some trees which are lacking on the Plain proper. The Sandhills are of sand over clay and are fixed by a native vegetation, which may be dense in the hollows with shrubs such as *Acacias* and *Eucalypts*, and in the open with herbaceous annuals. The associations of each of these areas are discussed in detail. In the Tarcoola region desert formations are present. A census with notes is given of the plants collected, including *Calotis multicaulis* (Turcz.) J. M. Black var. *breviradiata* n. v., *Siloxeras brachypappus* (F. v. M.) n. comb. (= *Angianthus brachy-*

pappus), *Anthotroche truncata* n. sp. (Solanaceae, near *A. Blackii* F. v. M.—Wm. Randolph Taylor.

5143. KRÄMER, H. J. Grundlagen für de Beurteilung der Wirkungen ausgeflockten Eisenhydroxyds auf Flora und Fauna natürlicher fliessender Gewässer. [The determination of the effect of the flocculent ferric hydroxid on the flora and fauna of natural running waters.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 148-168. 1924.

5144. McMURRAY, NELL. Wild crab-apples. Amer. Bot. [Joliet, Illinois] 31: 5-8. 1925.

5145. MILOJEVIĆ, BORIVOJE Ž. The Kingdom of the Serbs, Croats and Slovenes: Administrative divisions in relation to natural regions. Geog. Rev. 15: 70-83. Fig. 1-7. 4 maps. 1925.—The vegetation is described briefly and the relation of geologic structure to vegetation and land use is noted. A map shows the natural geographic regions.—S. B. Show.

5146. PEARSALL, W. H. Basic ratios and plant distribution. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 495. [1924.]

5147. PRIESTLY, J. H. Ecology of moorland plants. Nature 114: 698. 1924.—This is a review of papers by Stocker, Montfort, Clements and others.—O. A. Stevens.

5148. QUAYLE, E. T. The increasing run-off from the Avoca River Basin [Australia] (due apparently to deforestation). Proc. Roy. Soc. Victoria N. S. 35: 143-152. 1 fig. 1923.—The occupation of the area dates back about 60 years. Striking physiographic changes began about 1880. Floods now come on more rapidly and are heavier when they do occur.—In a particularly severe drought in 1914 the river did not fall below a flow of 5 cubic feet per second. In a less severe but exceptional drought in 1902, it ceased to flow during 7 months. It is concluded that the volume as well as the constancy of flow is increasing due to the gain of the springs, greater runoff because of better drainage from eroded channels, silting of water holes, paths made by stock, more moist subsoil, quicker saturation of subsoil due to killing of trees, the raising of the water table, etc. Changes such as this appear to be common to all the inland drainages. Hence inland water supplies may be greatly increased and, if properly utilized, this may be very beneficial. This also bears on the filling of inland lakes and seems to indicate climatic improvement. The flood rains, flood volumes, and total monthly rainfall from 1888 to 1922 are graphically presented.—Eloise Gerry.

5149. ROBERTS, E. A., AND M. F. SHAW. The ecology of plants native to Dutchess County, New York. iv + 21 p. Garden Club of America. [1924.]—This is a booklet containing a list of plants arranged according to associations. It is to serve as a working basis for the planting of an ecological garden and for the selection of plants for naturalistic planting.—E. A. Roberts.

5150. ROMELL, LARS-GUNNAR. Samspelet mellan olika produktionsfaktorer. [The cooperation of different production factors.] Skogsvarvsför. Tidskr. Ser. A. [Stockholm] 22: 89-120. 1924.—Evidence is presented in favor of Liebscher's neglected "optimum law," of 1895, as opposed to Liebig's "law of minimum" and Blackman's "theory of limiting factors." The latter may, indeed, be reduced to special cases of the former. The minimum law seems to have been supported in the past chiefly by its axiomatic character. When applied to plant production the error seems to consist in applying purely statistical reasoning to problems that are essentially dynamic. In dealing with plant nutrients it is really a question of concentrations and of reaction velocities rather than of absolute quantities. In a manured and an unfertilized plot, growth does not start at the same rate on both and then after a certain time come to a standstill on the latter.—Criticisms are given of the illustrations and examples used to support Liebig's law and of those employed by Blackman, and the claim is made that they have confused "factors" and "processes." Baule's "effects product law" is also criticised, since the assumed constancy of the standard unit for each factor is, in many cases, not in agreement with the facts. Further it fails to take into account the retarding effect of high intensities of factors; still, in many problems of plant production, it is better than the minimum law. The formulae and the applications of Baule's law are also discussed. It is shown that if exactly true generally, it would prove most useful in ecology especially if the properties and adaptations of plants could be defined in an exact and objective manner by properly determining standard units for the different factors. Mitscherlich's assertion, however, that the values of the standard units are independent of internal factors, is certainly not correct, for that would be equivalent to saying that there are no ecological differences between plants.

Unfortunately there are also difficulties in explaining "vicarious factors," for if factors which are neither able to replace one another physically, chemically or functionally, show ecological variations, we can expect to get no farther with physiological categories than with external factors. New facts seem to indicate that the somewhat anthropomorphic reasoning about the "wants" of plants is sterile of results and that we should take our similes and examples from the sphere of chemical dynamics rather than from human life. Since we know so little about the mechanism of life, the problems of ecology thus become more difficult than was anticipated.—*Author*.

5151. ROMELL, LARS-GUNNAR. Till frågan om frekvensfördelningsregelns tolkning. [The law of frequency distribution.] Svensk. Bot. Tidskr. 17: 231-240. 4 fig. 1923.—The author deals with the general aspect of empirical curves obtained by statistical analyses of vegetation according to the methods of Raunkiaer and others. Contrary to Nordhagen the peculiarities generally shown by these curves are not wholly dependent on the homogeneity of the unit or units under investigation, in fact, homogeneity is neither a necessary nor a sufficient condition for the normal form of empirical curves, nor do all homogeneous vegetation units give the characteristic curves.—The author, assuming that each ecological factor varies in 10 different intensities about a mean according to the rules of probability in 1,000 combinations, has calculated the frequency curves of these combinations where the "frequency of a combination" means the part of the surface where this combination occurs. These frequency curves show a striking similarity in all their essential features to the empirical curves of the frequency of species. This similarity may be explained on the assumption that each combination of ecological factors corresponds exactly and in detail with 1 or more species. This is only one possible explanation, others may be given. The fact that curves showing summarized analyses of many vegetation units of one type, but from different regions, are strikingly similar to those representing a single unit may be explained on the assumption that the types of units chosen are quite natural ones in which only continuous variation is found. Thus it seems probable that a usual probability curve may, in one way or another, generate all the empirical curves that may represent one vegetation unit or summarize several units of the same natural type.—*Carl Philipson*.

5152. SALISBURY, E. J. Plant distribution in relation to acidity. (Abstract.) Rept. British Assoc. Sci. 1923: 484. [1924.]

5153. SZYMKIEWICZ, DEZYDERY. Études climatologiques. IV. Sur le rôle écologique des vents. [Climatological studies. IV. The ecological role of winds.]—Acta Soc. Bot. Poloniae 2: 130-151. 3 fig. 1924.—Wind is important in accelerating transpiration especially when the roots are not able to keep up the water supply. The influence of sea-shore and mountain winds in deforming trees and in excluding them from regions swept by freezing winds is discussed.—*Author*.

5154. TRUFFAUT, GEORGES. Le Jardin alpin Edouard Coëz, à Bièvres S. et O. [The Alpine garden of Edouard Coëz at Bievres S. and O.] Jardinage 11: 88-90. 1924.—This Alpine garden was begun in 1908-1909 by Coëz who was a friend of Bonnier and Correvon. He wished to prepare his thesis on the acclimatization of mountain plants. Exact reproduction of the mountain conditions as to soil, rocks, light, etc. was given the plants brought to this garden. During the war this garden was not kept up. After the close of the war, his mother desired to give the garden to the National Society of Acclimatization in memory of her son. The garden is now in good hands under the direction of Bois, Loyer and Durand.—*L. Pace*.

5155. WINSLOW, C.-E. A., AND DOROTHEA H. SANJIYAN. Acid forming streptococci as indices of fomites pollution. Jour. Bact. 9: 513-525. 1924.—Streptococci were found in 62% of objects directly exposed to mouth pollution, in 42% of objects exposed to hand pollution and in 10% of objects not recently contaminated. The fact that materials not recently contaminated such as the under side of chairs and tables, top of corridor wall and roof of a college building which gave 4% positive tests when 1 sample was taken, 10% when 3 samples and 22% when 10 samples were used, delimits the value of the practice of using species of *Streptococcus* as indices of recent salivary pollution.—*C. E. Skinner*.

5156. YOUNG, R. T. Notes on the physiography of North Dakota and the conditions in certain of its waters. Ann. Missouri Bot. Gard. 10: 385-392. Pl. 19-20. 1923.—This paper

is given as an introductory note to the paper by MOORE, G. T., AND N. CARTER on the algae from lakes in the northeastern part of North Dakota. (See this issue, Entry 5474.) North Dakota is divided into 3 main areas, the Red River Valley, the Drift Prairie Plains, and the Missouri Plateau, which are described in some detail. On the Canadian border is a group of low, irregular hills, the Turtle Mountains. The lakes considered in this paper are found in the Turtle Mountains and in the irregular surface of the glacial till and boulders of the drift prairie plain. The lakes are grouped into (1) Freshwater, with a total alkalinity below 400 p.p.m., (2) intermediate, with alkalinity between 400 and 700 p.p.m., and (3) alkaline lakes in which the alkalinity exceeds 700 p.p.m. Analyses, which include CO_3 , HCO_3 , Cl , SO_4 , Mg , Ca , Na , K , SiO_2 , F_2O_2 and Al_2O_3 , and residue content, are given for Fort Totten Lake, Sweetwater Lake, and Devil's Lake, representatives of the 3 groups mentioned.—S. M. Zeller.

STRUCTURE, BEHAVIOR, SYMBIOSIS

5157. BUCH, HANS. Über Kutikula bewohnende Mikroorganismen der Lebermoore. [Microorganisms which inhabit the cuticle of liverworts.] Vorläufige Mitteil. Soc. Sci. Fennica Comment. Biol. 1⁵: (1-2). 1922.—Upon the leaves of many liverworts are found bacteria which apparently fix free nitrogen and which are in a symbiotic relation to these Bryophytes. In fact bacteria-bearing buds of *Ptilidium ciliare* grow abundantly upon a nitrogen-containing medium while, on the other hand, bacteria-free sprouts do not grow upon the same medium.—R. Collander.

5158. JURICA, HILARY S. A study in the grouping of plants. Bot. Gaz. 78: 326-334. Fig. 1-14. 1924.—Observations on a vertical and a horizontal type of rhizome, as these are related to the problem of local dominance, are reported. In *Eryngium yuccifolium*, after flowering in the 5th year, the erect stem dies, a scar being left on the crown of the vertical rhizome. Later, only 2 of the 6 basal buds develop into flowering shoots.—B. W. Wells.

5159. KNOKE, FRANZISKA. Abhängigkeit der Entwicklung des *Volvox aureus* von äusseren Bedingungen. [The effect of environment on the development of *Volvox*.] Bot. Archiv. 6: 405-420. 1924.—Warm, bright days increase the growth of *Volvox*, while dark, rainy days retard growth, the favorable temperature lies between 17 and 26°C.—William Scifriz.

5160. LOVELL, J. H. The bees of Maine. Maine Nat. 4: 71-76, 103-105. 1924.—This contains notes on the plants visited by different species of bees.—C. A. Weatherby.

5161. McMURRAY, NELL. Favorite flowers. Amer. Bot. [Joliet, Illinois] 31: 16-17. 1925.—The small bee, *Macropis ciliata*, is the only insect visitor to the flowers of the common loosestrife in the vicinity of Clearfield, Pennsylvania.—Susan P. Nichols.

5162. MIEHE, HUGO. Entwicklungsgeschichtliche Untersuchung der Algensymbiose bei *Gunnera macrophylla* Bl. [Alga-symbiosis in *Gunnera macrophylla*.] Flora 117: 1-15. 8 fig. 1924.—In *Gunnera macrophylla* an alga (probably *Nostoc punctiforme*) is found in cushion-like outgrowths which develop in groups of 3 above the leaf-base. These growths arise endogenously in the bud and are interpreted as atypical roots. Glands on the young leaves secrete a slime in which *Nostoc* occurs abundantly, but bacteria, protozoa and diatoms may also be found. The primary infection was not observed. The alga is apparently able to dissolve the middle lamella and move through canal-like intercellular spaces. The alga develops freely, filling the cells of a differentiated compact thin-walled tissue below the surface. No alga could be determined with certainty in the ovules or ovaries which were examined. The biological relation between the alga and *Gunnera* was not determined, but the latter seems to suffer no injury from the presence of either living or dead algal cells. The term "phycom" is suggested for such alga-bearing tissue, and the term "phycorhiza" for roots which contain such tissue.—A. G. Stokey.

5163. NUTTALL, G. H. F. Symbiosis in animals and plants. (Presidential address to Section I) Rept. British Assoc. Adv. Sci. 1923: 197-214. [1924].—The 1st part of this paper on symbiosis in plants, consists of a discussion of our knowledge of the following subjects from an historical standpoint: physiology of lichens; the root-nodules of leguminous and other plants; the significance of mycorrhiza in relation to various plants; mycorrhiza in orchids; the origin of tubers in various plants; mycorrhiza in Ericaceae; and mycorrhiza in club-mosses and ferns.—C. L. Wilson.

5164. RAYNER, M. C. Contributions to the biology of mycorrhiza in the Ericaceae. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 486. [1924.]

5165. SHULL, J. MARION. A Methuselah of the plant world. Jour. Heredity 15: 443-450. Fig. 1-7. 1924.—The Skunk Cabbage, *Spathyema foetida*, offers an interesting illustration of adaptation to environment. Its color scheme, the method by which the seed are distributed, and the way in which it grows downward instead of upward, serve to fit it ideally for its swampy surroundings. After reaching maturity the trunk of the plant does not increase in diameter. It is pulled into the earth by the contraction of the roots and rots off at the base. It is impossible to estimate the age of the plants. Some of them may be as old or older than the oldest trees.—H. Cook.

5166. WOOD, J. G. The relations between distribution, structure and transpiration of arid South Australian plants. Trans. and Proc. Roy. Soc. South Australia 48: 226-235. 7 fig. 1924.—Using methods previously described (Ibid. 47: 259-278. 1923. Transpiration was measured by a potometer, light by an actinometer, evaporation by an atmometer somewhat similar to Livingston's, and humidity by the wet and dry bulb readings.) The ecological anatomy of the foliage organs of *Kochia planifolia*, *Eremophila glabra*, *Acacia aneura*, *A. Victoriae*, *Loranthus quandang*, and *Senecio magnificus* were determined. The transpiration curves were of the same general type as that of the evaporating power of the air, those of the 3 first species being particularly low and that of the last very high. Emphasis is placed on the structure and abundance in arid South Australia of 2 desert types: (1) the indurated microphylls, characterized by being woody plants with reduced leaves, thickened cuticle and sunken stomata and represented by such forms as *Acacia aneura*, *A. spp.*, *Eremophila glabra*, *Geijera parviflora* and *Casuarina lepidophloia*; and (2) tomentose microphylls with dense tomentum over their epidermis represented by the saltbushes, *Atriplex spp.*, the bluebushes, *Kochia spp.* and certain species of *Rhagodia*. (See also Bot. Absts. 14, Entry 4185.)—Geo. D. Fuller.

VEGETATION

5167. BRAUN-BLANQUET, J., ET A. THELLUNG. Observations sur la végétation et sur la flore des environs de Zermatt. [The vegetation and flora of the vicinity of Zermatt, Switzerland.] Bull. Murithienne Soc. Valaisanne Sci. Nat. 41: 18-55. 1921.—The 1st part contains a list of species or hybrids that are rare or new to the locality. *Artemisia nivalis* Br.-Bl., n. sp., from the summit of Rothorn at 3410 m., is described. The plant communities of several peaks of 3000-3500 m. are described, special attention being given to the dynamo-genetic value of certain species exerting a constructive or a destructive influence upon various associations. The highest meadows (pelouses) at 3100 m. have associations of *Festuca pumila* and *Carex curvula*. A complete list of phanerogams (107 spp.) from the top of Gornergat, 3100-3130 m., proves it to possess the richest flora of any peak of comparable altitude in the entire chain of the Alps. The chief reason for this richness appears to be the summer dryness which encourages the upward extension of vegetation to such an extent that cereals are grown at 2120 m.—J. Braun-Blanquet.

5168. GAIDUKOV, N. Zur Oekologie der Süßwasseralgen. [Ecology of fresh water algae.] Bot. Archiv. 6: 112-123. 1924.—Collections were made from 12 waters of numerous kinds, including rivers, pools, and moors near the 2 Russian cities of Guss Chrystalnyj and Rjasan. Sphagnum desmids from one locality and Hypnum desmids from another locality contained but 10% of species common to both regions. The following 9 plant associations with their respective type species are named: (1) Elementary association of prominently mesosaprophytic Oscillatorias, *O. princeps* and *O. limosa* being dominant; (2) elementary association of Euglena in which *Euglena veridis* thrives well and Oscillatorias rapidly die out; (3) the ubiquists having besides the Euglenas, *Navicula cryptocephala* and *N. rhynchocephala*; (4) elementary Chlamydomonas associations, consisting chiefly of *C. Reinhardii* and *C. Ehrenbergii*; (5) associations of green "hydrocharitic" algae including different oligo- and mesosaprophytic green algae such as *Cladophora*, *Spirogyra*, *Mougeotia*, etc.; (6) the water-drift associations of the Schizophyceae, much like (5) and consisting of such forms as *Anabaena*; (7) bryophile associations either of *Hypnum* or of *Sphagnum*, differing as to the desmids they harbor; (8) elementary Chrysomonas associations and (9) the epiphytic association containing

such epiphytic forms as *Chaetophora* and small epiphytes such as *Calothrix fusca*.—William Seifriz.

5169. KAISER, P. E., AND E. SCHEFFELT. *Das Phytoplankton des Chiemsees nebst Algen-funden aus anderen Seen des Chiemgaus.* [The phytoplankton of Chiem lake with the distribution of algae in other lakes of the Chiem district.] Arch. Hydrobiol. u. Planktonk. 15: 141-178. 14 fig. 1925.—The catches were made with plankton net and dip flask, and counts made as usual. The plankton contains predominately diatoms, less abundantly blue green algae and flagellates. Green algae are very scarce. Chiem lake is in process of transition from an oligotrophic to a eutrophic condition. There are definite suspension layers, as recorded, save in autumn and spring when, due to circulation, the distribution is quite uniform, and when it is disturbed in winter by vertical streaming and storms. The specific gravity of the water influences this distribution. A list of the organisms of the phytoplankton is given, with biological notes.—Harold Kirby.

5170. KORPE, F. *Die Schlammflora der ostholsteinischen Seen und des Bodensees.* [The slime flora of the lakes and pools of East Holstein.] Arch. Hydrobiol. u. Planktonk. 14: 619-672. Pl. 7a, 10 fig. 1924.—Collections were made from a large number of lakes and pools in May and June. A distributional list is given of the bacteria, blue-green algae and flagellates found. The slime is a peculiar life environment, rich in methane, carbolic acid and hydrogen sulphide. Sulphur bacteria are therefore abundant, using hydrogen sulphide and oxygen. The periodicity of these slime organisms is dependent on the available oxygen, which in the depths of the lake disappears in summer and is supplied again when the water is agitated in the spring. The variation of temperature seems to have little influence. The red sulphur bacteria and some other bacteria-like organisms are very resistant to humus acids. The slime of lakes and its inhabitants is classified as follows: (1) Oligotrophic type, subalpine, the oxygen does not disappear in the summer; (2) Eutrophic (Baltic) type, where the water is clear, often yellow, rich in nutritive substance, with variable amount of O disappearance; (3) Dystrophic, poor in nutritive material, rich in humus colloids.—New descriptions are given of: *Pelonema hyalina*, *Beggiatoa uniguttata*, *Thioploca minima*, *T. mixta*, *Steineckia cylindrica*, *Oscillatoria angusta*, *Spirulina Schroederi*, *Pseudanabaena tenuis*, and *Bodo profundus*.—Harold Kirby.

5171. LUPO, PATSY HUGHES. *A tundra trip in Alaska.* Trans. Illinois State Acad. Sci. 16: 54-63. Fig. 1-4. 1923.—A description of the tundra in the neighborhood of Kougarok Mountain is given. The accumulation of humus freezes, thus preventing drainage, and hydrophytic conditions result. The types of tundra observed were: (1) pioneer lichen associations, (2) open dwarf shrub associations, (3) closed dwarf shrub associations, (4) *Carex-Eriophorum* associations, (5) *Sphagnum*-willow associations and (6) the grass associations of the flood plains. A brief description is given of each. It seems probable to the writer that the *Sphagnum-Ericad* tundra is the climax.—H. W. Anderson.

5172. NAUMANN, EINAR. *Die höhere Wasservegetation des Bach- und Teichgebietes bei Aneboda.* [Higher aquatic plants in the ponds and brooks of Aneboda (South Sweden).] Arkiv Bot. 19²: 1-31. 10 pl., 2 fig. 1924.—This is a survey of the aquatic vegetation of the different brooks and ponds in the district of the fishing station of Aneboda. The rate of water flow is the chief distribution factor and to a lesser extent the nature of the soil substratum. New ponds may in 10 years become overgrown with *Carex rostrata*, *Glyceria fluitans* and *Potamogeton natans*. In the vertical distribution of vegetation in the ponds all higher plants disappear at a depth of about 1 m. The water-culture in the ponds has practically no influence on the higher plants, in striking contrast to its influence on the plankton. For economic production from the ponds, both the absence of vegetation and its luxuriant development are unfavorable, the optimum being a moderate growth. A rotation of agriculture and water-culture will apparently give best results.—O. Heilborn.

5173. SASAKI, SYUN'ITI. *Plant zones on Mt. Morrison and oecological observations on its plants.* (Japanese.) Rept. Nat. Hist. Soc. Formosa 13: 121-174. 1923.

5174. SASAKI, SYUN'ITI. *Studies on the forest zones of Mt. Morrison (Formosa).* Rept. Dept. Forest. Res. Inst. Formosa 1: 1-108. 8 pl., 1 map. 1922.—Mt. Morrison in Formosa (Japanese name "Niitakayama") is the highest mountain in Japan and reaches an elevation of

4166 m. It is situated in Middle Formosa, just within the Tropic of Cancer, so that at its foot we see the tropical forest zone. In this zone *Areca Catechu*, *Mangifera indica*, *Euphoria longana* and *Bambusa stenostachya* are in cultivation and flourish very well, while *Bombax malabricum* is naturalised. In the virgin forests are *Cordia Myxa*, *Machilus Kusanoi*, *Macaranga Taniarius*, *Laportea pterostigma*, *Morus acidosa*, *Ficus leucantatoma*, *F. nervosa*, *F. Harlandi*, *Tetrapanax papyrifera*, *Sapindus Mukurosi*, *Liquidambar formosana*, *Bischofia javanica*, *Didymosperma Engleri*, *Dendrocalamus latiflorus*, *Alsophila latebrosa*. The soil surface is densely clad with plants, such as *Alocasia macrorrhiza*, *Musa formosana*, *Strobilanthes flaccidifolius*, *S. formosana*. *Epipremum mirabile*, *Milletia reticulata*, *Bauhinia Championi*, and *Mucuna ferruginea* are examples of lianas found in such forests. The tropical forest zone attains 758 m. Next in order up to almost 2430 m. extends the warm forest zone, of which the lower half is termed the "tropico-warm" zone (extending to 1670 m.). The tropico-warm forest zone, as hygrophytic as the tropical forest zone itself, is characterised by the occurrence of evergreen angiospermous trees, bamboos, *Calamus*, tree-ferns such as *Cyathea spinulosa*, and *Alsophila latebrosa*, *Musa formosana*, *Phoebe formosa*, *Helicia formosana*, *Cinnamomum Camphora*, *Alniphyllum Fortunei*, *Styrax suberifolium*, *Liquidambar formosana*, *Alnus formosana*, etc.—The flora of the warm forest zone (upper half of tropico-warm zone) is characterised by evergreen trees, belonging chiefly to *Quercus* and other Cupuliferae, for instance, *Q. Kawakamii*, *Q. stenophylla*, *Q. serrata*, *Castanopsis Kawakamii*, *C. Kusanoi*, *C. taiwaniana*, *Lithocarpus castanopsisifolia*, and *Pasaniopsis Junghuhnii*. *Quercus serrata* forms pure forests extending for several km. Epiphytes are abundant, such as *Asplenium Nidus*, *Polypodium cornans*, *Vittaria*, *Dendrobium*, etc.—The temperate forest zone which reaches the height of 3030 m. is divided into 2 parts. In the lower half (to 2400 m.), where frost and snow fall in winter a much larger number of deciduous trees may be seen than in the warm forest zone. The conifers form here dense forests. *Chamaecyparis*, *Pinus*, *Acer*, *Alnus*, *Arundinaria*, *Heptapleurum*, *Pasaniopsis*, *Villebrunea*, *Polygonum*, *Rosa*, *Plagyogyria*, *Pteris*, *Gleichenia*, and *Lycopodium* are some instances of plants growing there. The pure forest of *Chamaecyparis formosensis* begins to appear at an elevation of 2100 m., and that of *C. obtusa* at 2400 m. The upper half of the temperate forest zone is characterised by the occurrence of *Tsuga chinensis* which forms pure forests of colossal dimension. We have besides pure forests of *Pinus taiwanensis*, *P. Armandi*, *Taiwania crytomerioides*, *Picea morrisonicola*. The Rubiaceae and Lauraceae of alpine character, *Arundinaria*, *Berberis*, *Mahonia*, *Polygonum*, *Pinus*, *Pourthiaea*, *Osmanthus*, *Juniperus formosana*, *J. squamata*, *Abies Kawakamii*, and *Quercus* spp. are also found. In the cold forest zone which occupies the region above 3030 m. we see the luxuriant growth of shrubs of low stature which densely cover the soil surface, belonging to the genera *Juniperus*, *Rhododendron*, *Berberis*. Even at the very summit of the mountain such plants as *Juniperus squamata*, *Rhododendron pseudochrysanthum*, *Abies Kawakamii*, *Berberis morrisonicola*, and *Salix* sp. are growing. The flora of the Mount Morrison Range comprises a large number of endemic species and elements from the adjacent mainland and islands. The endemic number 235 out of 477 species, the numbers in the various regions being: tropical forest 76, warm forest 126, temperate forest 158, and cold forest 20. A list of species is given together with their distribution in other parts of the world.—Author. (Courtesy Japanese Jour. Bot.)

5175. SCHARFETTER, RUDOLPH. Die Vegetation der Turracher Höhe. Oesterreich. Bot. Zeitschr. 70: 77-91. 1 fig. 1921.—This region in southern Styria was originally a mixed coniferous forest dominated by pine, spruce and larch. So much of the forest has been cut down that the following additional formations are recognized: high moor, hay meadow, rocky floor, valley floor, and those dominated by each of the following plants—*Nardus stricta*, *Vaccinium myrtillus*, *Alnus viridis*, *Juniperus nana*, and *Rhododendron ferrugineum*. The important plants in each are given and the places where they occur are described. The author defines morphogenetic formations as those which are determined strictly by climatological or topographic factors. The vegetation on wind-swept slopes or places where the snow always remains late in the spring are examples.—T. D. Howe.

5176. TAKENOUCHI, MAKOTO. On the change of vegetation of the Tarumai volcanic range. (Japanese.) Bot. Mag. Tôkyô 37: (161)-(181). 5 fig. 1923.—This work is a con-

tribution to the ecological study of the Tarumai Volcanic range, situated in the southwestern part of Hokkaido. This range contains 2 prominent peaks, Tarumai and Fuppushinupuri. The former is an active the latter an extinct volcano. The zonal distribution of plants and an upper bare region covering a large area, which are clearly seen on the Tarumai, form a striking contrast to rich forests of the Fuppushinupuri, where we see no zones except the poor shrubby region near its top. According to the author's study, the zonal distribution of plants on the Tarumai is due to the recent development of vegetation on a volcano of recent activity. The vegetation is now unstable and constantly changing. In the course of time, it seems likely to gradually become fixed and similar to that of Mount Fuppushinupuri. The author also points out that the slopes of Mount Tarumai, being loosely made, are easily eroded by water, resulting in the destruction of vegetation and the initiation of a new succession.—*Author. (Courtesy Japanese Jour. Bot.)*

5177. WATERMAN, W. G. **Plant communities of Glacier National Park.** Trans. Illinois State Acad. Sci. 17: 29-34. Fig. 4. 1924. [1925].—The physiography of the park is sketched. The valley floors have an average of altitude of 4,000 feet, the passes 6,000-7,000, and the mountain summits 9,000-10,000 feet. The dominant plant formation is the Rocky Mountain conifer forest. The deep valleys of the east front are also filled with conifers. Mountain and alpine meadows exist with great variety and brilliancy of floral display. Many species of trees, shrubs and herbs are listed. The plant communities of the western slopes are interesting because of many species from the forests of the Pacific coast.—*H. W. Anderson.*

FLORISTICS

5178. ALLAN, H. H. **Notes on the occurrence of certain exotic plants in New Zealand.** New Zealand Jour. Agric. 29: 311-314. 1924.—A large number of exotic plants are mentioned and the habits of a few of the more important ones are briefly described.—*N. J. Giddings.*

5179. BAILLIE, HERBERT. **Seed and plant collecting in New Zealand.** Gard. Chron. III. 74: 20-21. 1923.—Notes are given on plants collected and their habitats.—*P. L. Ricker.*

5180. GÁYER, GY. **Néhány erdekes páfrány dunántúli előfordulása.** [Some ferns in Hungary beyond the Danube.] Bot. Közlemények 21: 79. 1923 [1924].—*Dryopteris lonchitis* grows in the upper valley of Koszeg, along with *Asplenium viride*, and near the village of Ajka. *Phyllitis scolopendrium* is found upon the walls of an old well in the village of Velem.—*I. Györfly.*

5181. GINZBERGER, AUGUSTO. **Un' escursione botanica al Nevoso.** [A botanical excursion to Mt. Nevoso.] Riv. Soc. Studi Fiumani 1: 151-182. 1923.—This is a translation by G. DEPOLI, the original having been published in Oesterreich. Bot. Zeitschr. in 1909. An account is given of a botanical excursion to the top of Mount Nevoso (Krainer Schneeberg or Snežnik). The plant associations and the affinities of the flora, along with notes on the nature of the ground, the altitude, etc., are given; 286 species of plants were observed, but no new species found. A review of other scientific excursions to the territory is also given.—*P. D. Caldis.*

5182. HEAL, JOHN. **Insectivorous plants.** Gard. Chron. III. 74: 160. Fig. 59. 1923.—Notes are given on plants of the genera *Sarracenia*, *Drosera*, *Pinguicula*, *Dionaea*, *Darlingtonia*, *Cephalotus*, *Heliamphore* and *Nepenthes*.—*P. L. Ricker.*

5183. KULCZYŃSKI, STANISLAW. **Das boreal und arktisch-alpine Element in der mitteleuropäischen Flora.** [Boreal and arctic-alpine elements in the flora of middle Europe.] Bull. Internat. Acad. Polonaise Sci. et Lettres Ser. B. [Cracovie] 1923: 127-214. 41 maps. 1923.—The 279 species representing these elements are divided into (1) the historically northern element; (2) the Tertiary, the 2 together comprising 73%; and (3) the monotypes not differentiated into geographical races. Subdivisions of these are recognized and discussed. The influence of the various ice sheets and the resultant migrations are considered. Numerous maps show the limits of glaciation in Europe and the distribution of the floral elements.—*H. Czechtz.*

5184. MATHEY, A. **Paysages du Maroc.** [Notes from Morocco.] Rev. Eaux et Forêts 59: 311-313. Pl. 1-2. 1921.—The castor oil plant has proved a valuable introduction in Morocco, both for its oil and for use in the fixation of sand dunes. Near Mogador are fine old

specimens of *Argania sideroxyylon*, but with no reproduction and with no sign of the secondary species which must have assisted in their original establishment. Other curious and interesting plants are the cactaceous Euphorbias which can hardly be indigenous to Morocco.—*S. T. Dana.*

5185. REICHE, H. C., AND R. H. BURTON. Some results of the first season's work at the University of Maine's summer biological station at Mt. Desert Island (1924). Part I. A list of the animals and plants found in the Oak Meadow region east of Newport Mountain. Maine Nat. 4: 116-132. 2 pl. 1924.—The collecting on which this list is based was done July 1 to Aug. 8, 1924, 3 or 4 trips being made weekly. The list is prefaced by a sketch of the topography and ecology of the area studied, about 1170 by 1160 feet. The botanical portion of the list covers Thallophytes, represented by 2 lichens, Bryophytes, represented by "*Sphagnum* sp." and 133 spp. of vascular plants. Arrangement and nomenclature follow closely RAND AND REDFIELD's Flora.—*C. A. Weatherby.*

5186. STEFFEN, H. Versuch einer Gliederung der arktischen Flora in geographische bzw. genetische Florenelemente. [Relationship among arctic plants in reference to geographic and genetic floral features.] Bot. Archiv. 6: 7-49. Fig 1-3. 1924.—The author gives the distribution of a large number of species in arctic, subarctic and alpine regions of the northern hemisphere.—*William Seifriz.*

5187. THODAY, D. The geographical distribution and ecology of the genus *Passerina*. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 492. [1924.]

FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 5007, 5071, 5138, 5139, 5140, 5141, 5145, 5148, 5174, 5175, 5177, 5184, 5411, 5494, 5575, 5576, 5605, 5618, 5634, 5643, 5648, 5691, 5692, 5697, 5714, 5742, 5872, 5944, 5960, 5987, 6007)

5188. ANONYMOUS. Änderung der Vorbildung für den Forstverwaltungsdienst in Bayern. [Changes in the preliminary training for Bavarian foresters.] Tharandter Forst. Jahrb. 75: 139-140. 1924.—A half year of practical field work is to be required of all candidates to enable them to orient themselves and acquire a foundation for their theoretical instruction.—*K. W. Woodward.*

5189. ANONYMOUS. Die 21 Mitgliederversammlung des Deutschen Forstvereins vom 14-20 September 1924 in Bamberg. [Meeting of the German Forestry Association.] Forstwiss. Centralbl. 46: 670-685, 722-727, 767-779. 1924.—The principal papers and discussions are summarized, dealing with the following subjects: (1) Airplane mapping as an aid to forest administration; (2) the principles of forest accounting; (3) the pine owl moth and its ravages; and (4) the economic importance and silvicultural treatment of white fir (*Abies pectinata*). The management of fir in the Schwarzwald of Baden is explained in considerable detail.—*W. N. Sparhawk.*

5190. ANONYMOUS. Übersicht der Ergebnisse der sächsischen Staatsforstverwaltung im Jahre 1922. [Report of Saxon state forests in 1922.] Tharandter Forst. Jahrb. 75: 124-125. 1924.—This is the usual statistical report of area cut over and yield in volume and value.—*K. W. Woodward.*

5191. ANONYMOUS. Washington's annual forestry conference. Timberman 26²: 164, 166, 168-170. 1924.

5192. ANONYMOUS. Western forestry and conservation annual. Timberman 26²: 56, 58-60, 62, 64, 146, 148, 152, 154, 156. 1924.—Extracts from the annual reports of the forester, fire specialist, and others are presented.—*Duncan Dunning.*

5193. ACKERMAN, RALPH H. Forest resources and lumber industry of Chile. U. S. Bur. Foreign & Domestic Commerce Trade Inform. Bull. 324. 1-29. 1925.

5194. ASHE, W. W. The profit in operating small top logs. Timberman 26²: 125-126.—Data from the Appalachian region are presented.—*Duncan Dunning.*

5195. BARTH, A. Om vore skoger og vort skogstel. [Our forests and our management of

them.] *Tidsskr. Skogbruk* 32: 401-422. 1924.—The results of forest depletion are pointed out. The State Forest Service controls only 20% of the total forest area of Norway. Maintenance of protection forests by proper cutting is important.—*W. H. Meyer*.

5196. C., W. T. The protection of timber in the sea. [Rev. of: ATWOOD, WM. G., AND A. A. JOHNSON. *Marine structures: their deterioration and preservation*. Report of the committee on marine piling investigations of the division of engineering and industrial research of the National Research Council (with the collaboration of WM. F. CLAPP, ROBERT C. MILLER, H. W. WALKER, H. S. MCQUAID and MARJORIE S. ALLEN.) *vi* + 534 p. 14 pl. National Research Council: Washington, D. C., 1924.] *Nature* 114: 744-745. 1924.

5197. CHAMBERLIN, W. J. Forest entomology. An account of the injurious and beneficial insects which affect forest and shade trees. Part I. 16 + 217 p. 8 fig.; Part II. 123 p. (Mimeographed.) Edwards Bros.: Ann Arbor, Michigan, 1924.

5198. CIESLAR, ADOLF. [Rev. of: BUHLER, ANTON. *Der Waldbau nach wissenschaftlicher Forschung und praktischer Erfahrung*. (Silviculture) Vol. 2. 679 p. E. Ulmer: Stuttgart, 1922 (see Bot. Absts. 13, Entry 114).] *Oesterreich. Vierteljahresschr. Forstw.* 41: 6-12. 1923.

5199. CIESLAR, ADOLF. [Rev. of: WAGNER, C. (1). *Die Grundlagen der räumlichen Ordnung im Walde* (Principles of the arrangement of stands in the forest.) 4th ed. *xv* + 387 p., 9 pl., 43 fig. H. Laupp: Tübingen, 1923; (2) *Der Blendersaumschlag und sein System*. (The border-cutting system.) 3rd ed. 17 pl., 49 fig. H. Laupp. Tübingen, 1923.] *Oesterreich. Vierteljahresschr. Forstw.* 41: 12-23. 1923.—As one of the leaders of "the back to nature" movement Wagner's books are the text for a résumé of the recent tendency away from pure planted forests.—*K. W. Woodward*.

5200. CLARKE, JOHN D. Protection of forest lands, etc. Report to accompany H. R. 4830. U. S. A. 68th Congress. 1st session: House of Representatives, Rept. No. 439. 8 p. 1924.

5201. COLLEY, REGINALD H. Utilization and conservation of the timber supply. *Science* 61: 107-109. 1925.—Fungi are the most important agents of wood destruction. The estimated annual loss from decay in the U. S. A., and the amount which is considered preventable are given in a table for numerous kinds of wood products. The loss by decay is put at nearly $\frac{2}{3}$ of the annual growth of new wood, and the preventable decay at 30% of the annual growth.—*C. J. Lyon*.

5202. CORNWALL, GEO. M. Suggested bill for state cooperation in reforestation of cut-overlands. *Timberman* 26²: 40-41. 1924.

5203. DOTZEL. Zur Wirtschaft im Hochspessart. [Silviculture in the High Spessart.] *Forstwiss. Centralbl.* 46: 626-632. 1924.—Commenting on VANSELOW's articles (See Bot. Absts. 12, Entry 6311; 13, Entry 162), the writer discusses the silvicultural treatment of oak and beech in the Spessart forest. He does not agree that the selection method employed during the last 50 years has failed to produce the desired results.—*W. N. Sparhawk*.

5204. ESCHERICH, K. Streudüngung und Drahtwurmbefall. [The use of forest litter as mulch, in relation to wire-worm infestations.] *Forstwiss. Centralbl.* 46: 645-648. 1924.—Recent injury to field crops by wire-worms (*Elaterid* larvae) is attributed partly to destruction of the moles, their natural enemies, and in even greater degree to the extensive utilization of forest litter for mulch. Litter from both pine and spruce forests was found to contain the worms in large numbers. While the farmers may be less eager to gather the forest "straw," the forests will benefit through its retention.—*W. N. Sparhawk*.

5205. ESCUDERO, ALF., Y DAVID SALAS. Estadística forestal del Estado de Jalisco. [Forest conditions of the State of Jalisco.] *México Forest.* 3: 4-9. 1 map. 1925.—The district of Guadalajara is described, with a list of the native and the principal introduced trees. Trees of the temperate region, such as pines and oaks, occur in mixture with tropical species, such as *Cedrela*, *Tabebuia*, and *Eriodendron*. The annual growth on the 827 sq. km. of forest-covered land is estimated at 180,500 cu. m. The State has recently shown an interest in forest conservation.—*W. N. Sparhawk*.

5206. EVENDEN, JAMES C. Forest insect problems of the Pacific Coast. *Timberman* 26²: 59-60. 1924.—An outbreak of the mountain pine beetle in lodgepole pine on the Blackfoot River drainage, Montana, started in 1913 and is still in severe epidemic stage, threatening to

destroy the remaining lodgepole stands in Montana. A survey in the summer of 1924 indicates that it is not economically feasible to check the infestation. Damage by the same species of beetle to western white pine in Idaho, to lodgepole pine in northern Idaho and southern Oregon, and to sugar pine in California is mentioned; and epidemics of the western pine beetle in California, the Black Hills beetle in western yellow pine on the Kaibab Plateau of Arizona, and of the pine butterfly in western yellow pine of central Idaho are discussed. Spruce budworm appeared in epidemic form for the 1st time in 1922 in northern Idaho and in Yellowstone Park, attacking all species of conifers in Idaho. Lodgepole pine over 100 square miles in central Idaho and Montana is infested with a new species of sawfly and a new species of leaf miner working together. On the Klamath Indian Reservation, bark beetles are killing much western yellow pine that was weakened through defoliation by caterpillars of the Pandora moth. For the past 10-12 years, in the southern Oregon and northern California control project area, bark beetles have killed an average of 119 million board feet of pine annually. Control work instituted in 1922 reduced the loss to 75 million feet. In 1924 the epidemic increased 30% in the control area and 300% outside. During 10 years, losses on this area from insects have been 50 times as great as losses from fire. Insect control work costs 7 cents an acre, fire protection 3-4 cents.—*Duncan Dunning.*

5207. FABRICIUS. [Rev. of: ENGLER, ARNOLD. *Die Hochdurchforstung*. (Thinning from above.) *Mitteil. Schweiz. Zentralanst. Forst. Versuchsw.* 13²: 285-351. 1924.] *Forstwiss. Centralbl.* 46: 688-689. 1924.—The reviewer points out that Engler disagrees with Biolley in insisting on a clear separation of final from intermediate yields in regulating the cut. (See also *Bot. Absts.* 14, Entry 3389.)—*W. N. Sparhawk.*

5208. FABRICIUS. [Rev. of: REBEL, KARL. *Waldbauliches aus Bayern*. II Bd. (Bavarian silviculture. Vol. 2.) 228 p. J. C. Huber: Diessen-vor-München, 1924.] *Forstwiss. Centralbl.* 46: 690. 1924. (See also *Bot. Absts.* 14, Entry 1336.)

5209. FABRICIUS. [Rev. of: WIEDEMANN, EILHARD. *Höhenwachstum und Humuszustand*. (Height-growth and condition of the humus.) 77 p. 24 fig. Paul Parey: Berlin, 1924.] *Forstwiss. Centralbl.* 46: 685-687. 1924.—The reviewer questions the theory that excessive heating of the soil during the dry periods can destroy the nitrifying bacteria to an extent sufficient to affect tree growth. He also asserts that it is not conclusively proved that lack of these bacteria is the real cause of growth stagnation.—*W. N. Sparhawk.*

5210. FERRISS, JAMES H. A state forest preserve. *Trans. Illinois State Acad. Sci.* 16: 46-50. 1923.—Cook County, Illinois, has obtained excellent results in establishing large forest preserves. A plea is made for a more extensive State park system and the purchase by the State of a number of beauty spots in widely separated localities.—*H. W. Anderson.*

5211. FORBES, A. C. The Imperial Forestry Conference of 1923. *Gard. Chron.* III. 74: 324, 340. 1923; 75: 11, 108. 1924.—Opportunity was offered the delegates to see all types of forest growth from New Brunswick to British Columbia. The limitations of the species examined and their 5 successions are extensively considered. The prairie and Columbia River districts are discussed in some detail.—*P. L. Ricker.*

5212. GLÜCK, KARL. *Regenerierung des Eichenwaldes durch Planzung*. [Regeneration of oak forests by planting.] *Wiener Allg. Forst- u. Jagdzeitg.* 42: 223-225. 1924.—The percentage of oak is decreasing in many Austrian forests, and artificial aid is needed to restore this valuable tree to its proper place in the stand. This can best be done by sowing acorns in the fall, although rodents are likely to destroy much of the seed. Planting is practical if seedlings not more than 2 years old are used. The deep roots develop so rapidly that the use of older seedlings is unsatisfactory. Oak should be grown in mixed stands wherever practicable. An over story of larch or white pine or some other species with thin shade is very beneficial.—*F. S. Baker.*

5213. GOUDIE, H. A. The growing of electric transmission or telegraph poles. *Tree species recommended for farm forests*. *New Zealand Jour. Agric.* 29: 243-253. 3 fig. 1924.

5214. HASLAM, R. T., AND W. P. RYAN. Countercurrent digestion of wood. *Indust. and Eng. Chem.* 16: 144-146. 1924.—By causing the strong caustic to flow in a counter current direction to the wood chips that are being digested, the time of digestion may be reduced by $\frac{1}{3}$ to $\frac{1}{2}$, increasing the α -cellulose content of the pulp, and producing a better bleaching pulp. There is a slight reduction in the total yield of cellulose.—*W. N. Sparhawk.*

5215. HAUCH, L. A. *Traearternes Tilpasning*. [Adaptation of tree species.] Dansk Skovfor. Tidsskr. 9: 486-495. 1 fig. 1924.—The theories of adaptation are briefly discussed, using beech as an example. Cutting should be done in such a way as to favor the trees of better form and growth.—*W. H. Meyer*.

5216. HAWKINS, PLINY HAINE. *The trees and shrubs of Yellowstone National Park*. 125 p. *Illus.* George Banta Pub. Co.: Menasha, Wisconsin. 1924.—The trees and shrubs are described, with special reference to their economic use and their relations to wild life.—*W. N. Sparhawk*.

5217. HEIMBURGER, K. *Hvad ved vi om Arvelighed og Racer hos Skovtraer?* [What do we know of inheritance and races in forest trees?] Dansk Skovfor. Tidsskr. 9: 563-596. 1924.—This is a review of the existing literature on the subject.—*W. H. Meyer*.

5218. HENRY, A. *The Avondale forestry station*. Gard. Chron. III. 74: 104, 119. 1923.—The hardiness and rate of growth of various trees in cultivation are noted.—*P. L. Ricker*.

5219. HEUSSER, C. *Proeftappingen bij Hevea-oculaties*. [Experimental tapplings with *Hevea* buddings.] (With English summary.) Mededeel. Alg. Proefsta. A. V. R. O. S. Rubberser. 40. 1-46. Fig. 1-19. 1924.—Tapping experiments were conducted with budded stock, the offspring of mother trees of known value. Tappings were taken on 20 consecutive days, all under uniform conditions, and the daily yields were calculated in terms of air dry rubber. The results indicate that: (1) Production of rubber in members of the same clone is uniform and increases with increase in stem girth, thickness of bark, and number of latex vessels; (2) the offspring from good, medium, and poor mother trees showed great differences. Bark graphs contrast the distribution of latex vessel rows in mother and offspring. The author maintains that the value of a mother tree can be determined only after tapping the offspring. If the offspring show good qualities, the mother tree is desirable for budding purposes. Results from budded material contrasted with illegitimate offspring from good stock indicate that the former are more desirable.—*Cecil Yampolsky*.

5220. INDA, JULIO RIQUELME. *Plaga de insectos en los pinos del vivero de árboles de Coyoacán*. [Insect damage to pines in the Coyoacán forest nursery.] México Forest. 3: 17. 1925.—Seedlings of *Pinus Montezumae* Lamb. have been injured by *Ips mexicanus* Hopk.—*W. N. Sparhawk*.

5221. JUGOVIZ, RUDOLF. *Deutscher Forstverein*. [German Forest Association.] Oesterreich. Vierteljahresschr. Forstw. 41: 2-6. 1923.—This is an account by an Austrian forester of the annual meeting of the German Forestry Association August 26-September 2, 1923, at Frankfurt-on-Oder.—*K. W. Woodward*.

5222. KINDT, S. *En Dansk Naturforyngelse fra Nord af Bøg*. [A natural reproduction of beech from the north of Denmark.] Dansk Skovfor. Tidsskr. 9: 473-495. 8 fig. 1924.—A good beech forest growing on land formerly in agricultural use on Naesbyholm was divided into 2 portions. In one, the reproduction cuttings progressed from south to north; in the other, cuttings were made from north to south. The 1st cut was in 1869, and the last in 1916. The soils are apparently alike. Difficulty with weeds was met in the 1st portion, requiring special treatment, but following this an excellent reproduction was obtained. The part opened from the north shows a reproduction spreading over several years in age, with individual development somewhat better than on the other portion. The standards left have grown well.—*W. H. Meyer*.

5223. KÖNIG, E. *Über Forstkulturwesen im Rauchschadengebiet*. [Forest culture in districts subject to smoke damage.] Tharandter Forst. Jahrb. 75: 113-123. 1924.—This is a consideration of the problems which arise near factories and how these conditions may be met.—*K. W. Woodward*.

5224. LAITAKARI, E., W. KAURIN, N. SCHAGER, AND ANONYMOUS. *Nordisk skogbruk*. [Scandinavian forestry.] Tidsskr. Skogbruk 32: 339-375. 1924.—This is a series of reports on forestry in the Scandinavian countries. Laitakari reports for Finland that the price index of forest products approached the pre-war level; imports in 1923 exceeded exports, which was not the case in 1922; a forest protection law was passed; and surveys showed 75% of the total area to be in forest. According to Kaurin, Norway's exports continued to increase from the low point of 1921; the proper method of cutting is still an important problem. For

Sweden, N. Schager reports low forest production in the winter 1922-1923, due to strikes; efforts were made to bring about better methods of cutting; the forest survey was extended to 2 more provinces; and the new forestry law became effective. In Denmark, 1923 was a year of normal forest production; prices were good; and a law was enacted to reduce taxation on heath plantations.—*W. H. Meyer.*

5225. L[EROY], C[H]. A new collector of Chinese plants. *Gard. Chron.* III. 75: 176. 1924.—M. Hers, a Belgian who settled in China many years ago and who is Director of the Lung Kai and Piers Lo Railways, is keenly interested in dendrology and in his spare time collects many seed which are sent to Europe and America. More than 2000 species have been collected, principally in the provinces of Honan, Kiangsu, Shensi and Kansu.—*P. L. Ricker.*

5226. LIAN, T. Norges vernskog. V. [Norway's protection forest. V.] *Tidsskr. Skogbruk* 32: 569-576. 5 fig. 1924.—The recession of the timber line and the need for protection forests in the upper Setesdal district are discussed.—*W. H. Meyer.*

5227. LOTHIGUS, WILH. Skogsvårdsstyrelsernas verksamhet åren 1920-1923. [Activity of the Forest Conservation Boards in the years 1920-1923.] *Skogen* 12: 24-27. 1925.—In the last decade, 164,000 ha. were sown or planted, 6420 km. of ditches were constructed through swamp land, and on 9000 ha. the soil was treated, to secure natural reproduction. Fifteen of the boards maintain their own seed extraction plants. The requests of private owners for aid, especially in southern Sweden, have become so numerous that increased grants from the State will be necessary to enable the boards to continue with full efficiency.—*Henry I. Baldwin.*

5228. MELLSTRÖM, GÖSTA. Skogsträdens fruktsättning år 1924. [Fruit-setting of forest trees, year 1924.] *Skogen* 12: 1-19. 1925; (also issued as Statens Skogsförsöksanstalt Flygblad 33).—The weather was cold and wet during the 1st half of 1924; in the summer it was very warm in northern Sweden and about normal in other sections. A fair supply of *Pinus sylvestris* seed is expected; that with germination above 50% comes from south of the 13°C. isotherm for June-August. Due to the cold spring, *Picea excelsa* flowered late in 1924. The crop of spruce cones is abundant, especially in southern and central Sweden, and comes at an opportune time, because the supplies of stored seed are nearly exhausted. Seed production of *Larix europea*, *L. sibirica*, *L. leptolepis* and *Abies pectinata* was only moderate. Broad-leaved species produced a fair crop.—*Henry I. Baldwin.*

5229. METZGER, C. Nordisk skogbruk, set med tyske øine. [Scandinavian forestry, seen with German eyes.] *Tidsskr. Skogbruk* 32: 590-598. 1924.—This is a summary of an address before the Swedish Forestry Society. Scandinavian forestry is said to be centuries behind continental forestry. On a percentage basis, the rate of growth is satisfactory, but the average volumes should be greater. The average stand of timber in Denmark and Germany is almost 3 times as heavy as in the northern countries. The need for legal and educational measures is discussed.—*W. H. Meyer.*

5230. MILLER, J. M. The Black Hills beetle on the Kaibab Forest. *Timberman* 26²: 50. Fig. 1-2. 1924.—A survey of the Kaibab Plateau made by the Bureau of Entomology in 1924 showed that 128 million board feet, or 12% of the stand of western yellow pine, had been killed by *Dendroctonus ponderosae* since 1919. In 1923 alone, 81,980 trees, or 25 million board feet, were killed.—*Duncan Dunning.*

5231. MIYABE, KINGO, AND YŪSHUN KUDŌ. Icones of the essential forest trees of Hokkaido. Fasc. 9-10. Explanations in English and Japanese. 22 p. 6 colored pl. Tokyo, 1923.—Fasc. 9 contains *Betula Ermani* Cham., *Betula japonica* Sieb. and *Alnus japonica* Sieb. & Zucc. var. *arguta* Call. Fasc. 10 contains *Alnus hirsuta* Turcz., *Alnus Maximowiczii* Call. and *Alnus pendula* Matsum.—*Authors.* (Courtesy Japanese Jour. Bot.)

5232. OPPERMANN, A. Daekningsskov og Nabovirkninger. [The forest canopy and its silvicultural significance. Parts 5-9.] *Dansk Skovfor. Tidsskr.* 9: 451-472. Fig. 9-12. 1924. (See Bot. Absts. 14, Entry 3377.)—Leaf fall and seed distribution are discussed, with particular reference to the effect of tree height, temperature, and wind. While formerly the arrangement of the forest in even-aged blocks was favored, now more freedom in treatment is sought, as illustrated by several examples. The extent of reproduction in time and space is considered, with examples of various methods in several localities. The production of

standards, with its effect on soil and reproduction, offers unsolved problems. Clean cutting has never been practised in Denmark; some form of selection cutting has generally been used.—W. H. Meyer.

5233. PATTON, R. T. On the drying of timber. V. Proc. Roy. Soc. Victoria. N. S. 35: 62-85. Fig. 1-9. 1922.—The following factors in the drying of timber are discussed: (1) Moisture content. To determine whether heartwood plays an important part in water storage of trees, the moisture distribution was studied in 5 trees of *Quercus robur*, felled at intervals between March 2 and September 1. It appears that the moisture content of the heartwood is constant through the year, with a steady rise from center to sapwood. *Pinus silvestris* and *Picea excelsa* show uniformly low moisture in the heartwood with a sudden rise in the sapwood. The distribution of moisture in *Populus nigra*, *Betula alba* and *Ilex aquifolium* is somewhat erratic.—(2) Diffusion of moisture. The amount of moisture lost by diffusion is proportional to the gradient of concentration and the area of the evaporating surface, and is also affected by temperature and humidity. Let t = time in days, x = amount lost in grams, c = the concentration, l = length in inches, A = area of diffusing surface and D = a diffusion constant, then $\frac{dx}{dt} = \frac{Ddc.A}{dl}$. If this formula can be applied to wood, the

value of D will give a measure of the ease with which any particular timber parts with its moisture. The values of D , obtained by methods described in the paper, vary from 0.0038 in oak to 0.0173 in pine. As soon as drying commences a gradient is established, whatever the temperature or humidity. If a gradient is formed then there can be no such condition as fiber saturation. (The author differs here fundamentally from the ordinarily accepted view.) The steepness of the gradient depends partly on the rate at which the moisture is being lost and partly on the rate at which moisture can move through the wood to the evaporating face. The water in the cells is asserted, without further explanation, to pass to the outside by means of the cell walls, not through the cavities of the empty cells. If it passed from cell to cell as is necessitated by the fiber saturation theory, then there would have to be osmotic substances present in the cavities of the cells, and these do not exist. The effect of vapor pressures does not appear to be taken into consideration. The only path for the moisture to reach the exterior is along the cell walls. (3) Evaporating surface. Curves showing the rates of loss from different faces had the same form for all timbers. The general equation of the curves is $l = at^b$ when l is the loss in time t , a the loss for the 1st day, and b a constant for any 1 curve. Both a and b are greatest for the transverse face, while the curve for the radial face is always the lowest. All curves fall between a straight line ($b = 1$) and a parabola ($b = 0.5$). Polarized light shows that the micellae in the fibers and in the medullary rays are arranged parallel to the length of the cells, and moisture moves most rapidly in this direction. By cutting blocks with faces of different size it is possible to make all 3 curves come to 1 point at the end of a given drying period, but not to make them coincide. (4) Thickness. Studies of the effect of thickness on time of drying show that the amount of water lost in a given time is independent of thickness until the reservoir of moisture begins to be exhausted. That point is reached at different times for pieces of different thickness. This corresponds with Tiemann's observation that "for $\frac{1}{2}$ inch or less the time should be decreased as the square of the fractional part of an inch, and should be increased in proportion to the thickness up to 3 inches and about $1\frac{1}{2}$ times the thickness for over 3 inches." (5) Humidity and (6) Temperature. Experiments in drying oak, beech, elm, and chestnut were carried out at 8 different humidities, ranging from 2 to 95% and at temperatures of 20, 30, 40 and 50°C. At 20° losses increased with decrease in humidity but at the other temperatures the maximum loss occurred at 7% and the loss was again less at 2%. These experiments show that there appears to be a limiting humidity below which drying is retarded. The ratios of loss of weight on the 1st day to the loss on subsequent days vary between t and $\sqrt{t}$ for different humidities and temperatures. At low humidities the ratios approach $\sqrt{t}$ and at very high humidities t , which is a straight line. But the nearer a straight line is approached the slower is the drying. Rapid drying under the conditions used was found to increase the amount of shrinkage. Shrinkage of oak blocks increased with temperatures from 20 to 50°C.—H. D. Tiemann.

5234. PEARSON, C. H., AND SON HARDWOOD CO., INC. *Tropical woods*. 64 p. 33 illus. Pub. by author: New York, 1924.—Information is given regarding the sources, sizes, properties, and uses of the tropical woods used in the U. S. A.—*W. N. Sparhawk*.

5235. PEARSON, G. A. The growing season of western yellow pine. *Jour. Agric. Res.* 29: 203-204. *Fig. 1-2*. 1924.—During the summer of 1923, records of the diameter growth of 2 trees (*Pinus scopulorum*) were obtained at the Southwestern Forest Exp. Sta. by means by MacDougal's dendrograph. The smaller tree, 5.4 inches in diameter, began growing May 16 and continued at an irregular rate for 117 days, until September 10. The larger tree, 15.8 inches in diameter, did not show an increase until June 1, and ceased growing about August 27, a growth period of only 88 days. It is sometimes difficult to distinguish between actual growth and variation in diameter with changing moisture content.—*Author*.

5236. PETRINI, SVEN. Några olika slag av medeltal. [Some different kinds of averages.] *Skogen* 12: 20-23. 1925.—It is important to select material to be averaged by dividing into equivalent groups. Simple arithmetic averages may give highly misleading results; a better plan is to employ weighted averages, rounded by curves, or simply to throw out 33-40% of the values occurring least frequently. In classifying site qualities by average height, inaccuracies in computing the average may be of great moment. Considering only the dominant trees yields good results in practice.—*Henry I. Baldwin*.

5237. PJETSCHKA, FERD. Altes und Neues auf dem Gebiete des Waldbaues. [Old and new in the realm of silviculture.] *Wiener Allg. Forst- u. Jagdzeitg.* 42: 253-254. 1924.—A résumé of the forest history of Austria from the earliest times is followed by a brief description of the chief silvicultural systems, in which the damage to the soil productivity is particularly noted. The new "Dauerwald" system is discussed at some length. It includes all systems where natural reproduction is secured without definitely breaking the canopy. A long period of regeneration is also usually assumed, as the maintenance of a continuous virtually natural forest is the chief aim of the system.—*F. S. Baker*.

5238. PODHORSKY. Die Volkerziehung zur Baum- und Waldkultur im Zeichen nationalen Wettbewerbs. [The popular appeal of tree and forest culture.] *Wiener Allg. Forst- u. Jagdzeitg.* 42: 265-267. 1924.—The popular tree planting movements in Spain, France, Germany, the U. S. A. (Arbor Day), and Italy (Feast of the Trees) are described.—*F. S. Baker*.

5239. PRINTZ, ED. Die Wälder und die Holzproduktion Amerikas. [The forests and timber production in America.] *Wiener Allg. Forst- u. Jagdzeitg.* 42: 217-219, 230-232, 236-237, 268-280, 290-291. 1924.—This is a compilation of information, much of it out-of-date, regarding the forests of North, Central, and South America. It consists chiefly of a brief description of the forest trees, their ranges and their wood.—*F. S. Baker*.

5240. RESVOLL-HOLMSEN, HANNA. Granes vestgraense i Norge. [The western limit of spruce in Norway.] *Tidsskr. Skogbruk* 32: 583-589. 1924.—This is an answer to A. SMITT's and J. G. JUUL's criticisms of a previous article under the same name. According to Dengler's theory, the natural limit for spruce would follow the 0°C. isotherm for February. While local factors prevent spruce from reaching that line at all points, it is never found beyond. Planted forests are not considered.—*W. H. Meyer*.

5241. SAXLUND, M. Norges vernskog. III. [Norway's protection forest. III.] *Tidsskr. Skogbruk* 32: 467-474. 1924.—The lowering of the timber line and need for protection in the Møsvatn region are discussed.—*W. H. Meyer*.

5242. SHERRARD, E. C., AND G. W. BLANCO. Partial hydrolysis of white spruce cellulose. *Indust. and Eng. Chem.* 15: 1166-1167. 1923.

5243. SHOW, S. B. The management of forest properties in the California pine region as a problem in applied ecology. *Sci. Monthly* 19: 548-551. 1924.—Fires not only reduce the volume of standing timber but also have a selective action in stands of more than 1 species. Hence the composition of an existing mixed forest does not furnish a reliable criterion of what the forest may become if fires are stopped.—The surest means of continuing a forest is by taking advantage of advance reproduction. The domination of tolerant and less valuable kinds of trees must be controlled, and the more desirable kinds should be maintained as important constituents of the forest.—*L. Pace*.

5244. SINZ, R. Beitrag zur Geschichte des Naunhofer Staatswaldes. [The history of the

Naunhofer State Forest.] Tharandter Forst. Jahrb. 75: 126-139. 1924.—The changes which have taken place in this forest since 918 A.D. are set forth in detail.—K. W. Woodward.

5245. SÜSSMANN. [Rev. of: HENNERT, CARL WILHELM. *Über den Raupenfrass und Windbruch in den Kgl. Preuss. Forsten in den Jahren 1791-1794.* (Caterpillar defoliation and windfall in the Prussian forests, 1791-1794.) Berlin (?), 1797.] Forstwiss. Centralbl. 46: 637-644. 1924.—The book is of especial interest at this time because of the recent extensive damage by the owl-moth in eastern Germany.—W. N. Sparhawk.

5246. SUTHERLAND, JOHN. *Slash disposal.* Timberman 26²: 146. 1924.

5247. TOTTINGHAM, W. E., AND F. GERHARDT. *Quantitative methods for the analysis of hemicellulose in apple wood.* Indust. and Eng. Chem. 16: 139-140. 1924.

5248. U. S. A. DEPT. AGRICULTURE. *The national forests of Arizona.* (Prepared by the Southwestern District of the Forest Service.) U. S. A. Dept. Agric. Dept. Circ. 318. 1-18. Fig. 1-8, 1 map. Washington, 1924.—The 9 forests, covering about 12 million acres and containing 73% of the timber of the State, are briefly described.—W. N. Sparhawk.

5249. VINNEDGE, R. W. *Logging and milling losses in Pacific Coast states.* Timberman 26²: 222-225. 1924.—In the Pacific Northwest, losses from breakage in falling probably average 3-4% but may be 20-40% on rough ground. High stumps, poor judgment in marking and grading logs, and the demand for even lengths by wood-using industries are serious sources of loss. Attempts to salvage small logs by relogging after removal of the large timber have not proved economical because the products obtained are of low grade and the equipment available was designed for handling large timber. Utilization of logging waste as fuel wood is rarely feasible because of high freight rates. Fire losses might be reduced by educating and restricting the public, as only 14½% of the fires in the operations described were chargeable to logging. Waste in milling is due to thick saws, poor sawing, sacrificing volume to improve grades in trimming, and improper seasoning. Studies should be made to determine uses for by-products and the public should be taught to buy grades of material consistent with the use to which it is to be put. Restrictions on association activities and excessive taxation are also asserted to lead to wasteful practices.—Duncan Dunning.

5250. VORREITH. *Waldbauliche Studien über die Hochgebirgslärche.* [Silvicultural studies of the larch.] Wiener Allg. Forst- u. Jagdzeitg. 42: 277-278. 1924.—The results are given of complete stem analyses of *Larix europea* at 700, 950, 1100 and 1350 m. elevation in the Austrian Alps. Height growth is less, both absolutely and in relation to diameter, as elevation increases. This is especially marked in youth and is regarded as necessary in developing enough stoutness to resist snow crushing at high elevations. In planting, trees should be used which were raised from local seed or seed from a locality where the height and diameter growth relationships are similar. Otherwise slow growing larch may be planted at low elevations, with great loss of possible increment, or fast growing larch may be planted too high, where it will be destroyed by snow.—F. S. Baker.

5251. WAHLENBERG, W. G. *Fall sowing and delayed germination of western white pine seed.* Jour. Agric. Res. 28: 1127-1131. Fig. 1-4. 1924.—This is an account of the experiments on which the U. S. A. Forest Service bases its recent sowing practice with *Pinus moniticola* at the Savenac nursery in western Montana. Many serious disadvantages arising from spring sowing and the resultant delay in germination seem to be completely avoided by sowing during the 1st half of September. Earlier sowing causes premature (fall) germination and later sowing decreases germinative capacity. The present practice results in prompt and complete germination the following spring, secures a regular and full stand of seedlings, and obviates the necessity for shading and mulching the beds.—Author.

5252. WEBSTER, A. D. *Bog oak timber.* Gard. Chron. III. 73: 198. 1923.—Because of the action of the bog in which it is found imbedded, Irish bog oak timber is usually dark brown or black, polishes well, and is extremely hard. It is almost indestructible. So much care is required in drying and seasoning that nearly 7 years elapses between digging out the logs and conversion into furniture. It makes fine furniture, panels, and novelties, besides being an excellent building timber.—W. N. Sparhawk.

5253. WEBSTER, A. D. *The most profitable tree to plant.* Gard. Chron. III. 73: 108. 1923.

5254. WIMMER, E. Beiträge zur Biologie der Kiefer. [Notes on the biology of the pine.] Forstwiss. Centralbl. 46: 534-554. Fig. 1-2. 1924.—The writer discusses the results of experiments in growing seed of *Pinus silvestris* from different parts of its range. The results of these investigations in Hesse confirm the findings of others, that seed of the native race of pine, or that from a region of similar climate, is the best to use in any given locality. The bad reputation of seed from southwestern Germany is not deserved, for it produces better trees and gives larger yields than seed from other regions, when used in regions of fairly low altitude (the "beech" zone) and oceanic climate.—W. N. Sparhawk.

GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 4071, 4982, 4985, 4986, 4989, 4991, 5009, 5113, 5127, 5128, 5136, 5217, 5254, 5364, 5376, 5378, 5437, 5472, 5536, 5668, 5680, 5689, 5733, 5789, 5792, 5973)

5255. ANONYMOUS. Sex determination. Nature 114: 804. 1924. (This refers to an article by F. ROGERS BRAMBELL in Science Progress for October.)

5256. ANKEL, W. E. Der Spermatozoendimorphismus bei *Bythinia tentaculata* L. und *Viviparus viviparus* L. [Spermatozoon dimorphism in *Bythinia tentaculata* L. and *Viviparus viviparus* L.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 85-166. 3 pl., 10 fig. 1924.—In the testes of *Bythinia*, 2 sorts of cells are found side by side. One kind develops normally into typical spermatozoa, the other develops abnormally, giving an atypical end result. In the development of typical spermatozoa, the 1st of the 2 maturation divisions is reductional, and is preceded by all of the usual stages—leptotene, pachytene, strepsinema and diakinesis. The reduced number of chromosomes is 17. A detailed description of the organization of the mature spermatozoon is given. The head is developed mainly from the nucleus of the spermatid, the acrosome from the statosphere, the middle piece from the chondriosome, and the axial filament from the centriole. Contrasted with this normal development, is the development of the atypical spermatozoa. Instead of 2 maturation divisions, there are 4, no one of which is a typical reduction division. In the 1st division, the usual mitotic figure is lacking. The chromosomes, which are diploid in number, are gathered into 2 approximately equal groups, one of which passes to each pole. The 2nd division is a very unequal one. A small spindle is formed, into which 2 of the many chromosomes come to lie. These are divided transversely, and 2 halves pass to each pole. The rest of the chromosomes take no part in the mitotic process, lying in a heap near 1 pole of the spindle. As a consequence, one of the resulting cells has 2 chromosomes (the "oligopyrene" cell) and the other has all of those remaining ("hyperpyrene" cell). In the 2 subsequent divisions, oligopyrene cells divide equally, and the hyperpyrene cells unequally, so that the 4 successive divisions finally result in 14 oligopyrene, and 2 hyperpyrene cells. The equal divisions of the oligopyrene cells are in all respects typical mitoses. Oligopyrene cells, after the 4th mitosis, develop by a process similar in detail to that which forms the typical, or eupyrene spermatozoa, and become spermatozoa that are like the typical ones, except for the fact that they are smaller. The hyperpyrene cells degenerate in most cases, but sometimes develop into large, hyperpyrene spermatozoa. In *Viviparus*, the 2nd division was found, as in *Bythinia*, to be unequal, differing from the latter in no important way. Spermatozoon dimorphism is considered due to an internal factor rather than to external influences. There is a conflict between this disturbing factor and the power to develop into normal spermatozoa.—Ralph E. Cleland.

5257. BALLOWITZ, E. Die Spermiozeugmen und Spermien der Schwimmkäfergattung *Hyphydrus*. [The "spermiozeugmen" and sperms of the water-beetle, *Hyphydrus*.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 590-600. 3 pl., 1 fig. 1924.—The spermatozoa of *H. ovatus* L. have a flat, 3-cornered, leaf-like head, and a moderately long flagellum. In the genital tract of the ♂, these fuse together in the posterior portion of the head region, and form compound structures known as "spermiozeugmen," which are transferred in this condition to the seminal receptacle of the ♀. These structures are long, some-

what flat and sinuous plates beset on one edge with long teeth, like a comb, and bearing from close to the other edge a dense row of flagella. At one end, the plate tapers into a long pointed structure, crowned by a javelin-like point. The individual spermatozoa have united by the surfaces of their heads to form this structure, which swims actively about in the seminal receptacle of the ♀, and acts as a unit in fertilization. Each tooth of the comb-like edge is the still separated anterior portion of the head of an individual spermatozoon, and corresponding to it on the other edge is a flagellum.—*Ralph E. Cleland.*

5258. BĚLAŘ, KARL. Die Cytologie der Merospermie bei freilebenden Rhabditis-Arten. [The cytology of merospermy in free-living species of Rhabditis.] Zeitschr. Wiss. Biol. Abt. B. Zeitsch. Zellen- u. Gewebelehre 1: 1-21. 13 fig. 1924.—The eggs of *Rhabditis monohystera* and of 2 unnamed species of nematodes ("XVIII" and "XX") were examined both in the living state and by means of sectioned material. Virgin females of these species lay eggs, but these fail to develop. Inseminated females lay eggs that develop normally so long as their seminal receptacles retain a supply of sperm. All eggs have to be penetrated by sperm in order to develop, but in the case of those that develop into females, the sperm nuclei degenerate in the cytoplasm of the egg without fusing with its nucleus, and the eggs develop parthenogenetically. In those eggs which develop into males, however, normal amphimixis occurs. The percentage of males in a population is only about 7%. The sperm enters the egg at the anterior end. In those that are destined to become females, the sperm nucleus remains near this end, and the egg nucleus, after having cut off 1 polar body, migrates toward it, returning shortly to the center of the cell without having fused with the sperm nucleus, but having acquired, while in that region, a pair of centrosomes. The sperm nucleus in time disintegrates, and the egg develops parthenogenetically. The spermatogenic origin of the centrosomes was demonstrated by studying living eggs under conditions of oxygen deficiency. This caused a complete cessation of the protoplasmic movements in the egg, and prevented the egg nucleus from migrating to the anterior pole. It did not, however, inhibit the normal growth and development of the egg nucleus. In such cells, a centrosome appeared at the usual time in the region of the sperm nucleus, dividing into two. As long as the egg was in an oxygen-deficient medium, the egg nucleus and centrosomes did not approach. But as soon as oxygen was allowed access once more, the normal movements began again (providing the period of deprivation was not too long) and the egg nucleus moved over to the centrosomes, and then returned with them to the center of the cell, the subsequent development being normal. Thus it was seen that the centrosomes arise independently of the egg nucleus, and in the immediate region of the sperm nucleus. The author believes that they have come from the middle piece of the sperm. In one case, evidence supporting this belief was also obtained from sectioned material. The spermatogenic origin of the centrosomes is further shown by the fact that in amphimictic eggs the centrosome does not appear until the moment that the egg nucleus, in its migration, touches the male nucleus; also by the fact that when such eggs are deprived of sufficient oxygen supply, the centrosomes are again seen to develop in the region occupied by the male nucleus, while the egg nucleus is prevented from leaving its central position. A study of polyspermy also tends to confirm the fact that the functioning centrosomes are derived from the sperm. Thus, the sperm contributes centrosomes to the egg nucleus, but does not contribute any nuclear material. This condition is called merospermy. While amphimixis does not occur in most cases, the entrance of the sperm is nevertheless necessary in order to stimulate further development on the part of the egg. In species of nematodes (for example, "XIX") where true parthenogenesis occurs, and the entrance of the sperm is not necessary as a stimulus, the centrosome appears during diakinesis, much earlier than in those above described. Here it appears in close proximity to the egg nucleus and has no connection with a sperm. So, in truly parthenogenetic eggs, the egg centrosome functions, but in others it becomes inactive and the centrosome arising from the sperm is necessary as a stimulus to further development of the egg.—*Ralph E. Cleland.*

5259. BENEDICT, R. C. The moss-leaved fern. Jour. Heredity 15: 19-24. Fig. 8-13. 1924.—The article discusses and describes a new variety of fern, *Nephrolepis Trevilliani*. As a commercial variety, the new form is scarcely of importance. Scientifically it is remarkable as presenting for the 1st time the combination of the lace type of division, 3-4 times pinnate,

together with the cresting or forking of its leaf divisions of all degrees; also for the fact that it is capable under certain conditions of giving rise viviparously to new plants directly from its leaves, instead of only from the runners or stolons.—*H. Cook.*

5265. BENEDICT, R. C. Variation among the sporelings of a fertile sport of the Boston fern. *Jour. Heredity* 15: 379-394, 421-431. *Fig. 8-16, 4-9.* 1924.—The paper deals with a series of new forms which have arisen in the spore cultures of the only known fertile variety in the whole Boston fern series, *Nephrolepis exaltata bostoniensis fertilis*. In the 1st culture 41 well differentiated sporeling plants were selected. These varieties present some forms which parallel the variations of the Boston fern and also other forms distinct from any of the latter.—*H. Cook.*

5261. BLARINGHEM, L. Sur la dégénérescence des lins à fibres. [Degeneration of flax in fibre.] *Compt. Rend. Acad. Sci. Paris* 179: 418-420. 1924.—Parallel cultures were studied of native and Russian lines of flax when grown under conditions of protection from light and in the open. Length of stem and length of the peduncle of the 1st fruit were studied. The lines protected from an excess of light produced longer stems than when grown under open conditions but the length of peduncle of the 1st fruit was little modified. The statement was made that the alteration in the development of characters was a result of an excess of light which affected the young plants at the beginning of their growth. The Russian lines were modified to a greater extent than the native lines. The Russian lines were heterozygous and the degeneracy led to a change in the genetic constitution. In order to protect Russian flax varieties to as great an extent as possible from degeneracy when grown in France they should be selected on a pure line basis and should be grown under conditions of protection from an excess of light.—*H. K. Hayes.*

5262. BOEDYN, K. Die typische und heterotypische Kernteilung der Oenotheren. [Somatic and heterotypic cell divisions in *Oenothera*.] *Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre* 1: 265-277. 17 *fig.* 1924.—Studies were made of somatic mitoses in a number of species, mutants and hybrids; and of the reduction divisions in *O. lamarckiana*. In general, the cytological behavior was found to conform to the scheme found in other plants, and exception was taken to descriptions of aberrant behavior, such as would tend to make the *Oenotheras* appear as impure species. In somatic cells, the chromosomes are organized from the nucleolus, which disappears as they are formed. Each chromosome becomes split longitudinally, but there is no pairing of the separate chromosomes. In form and size they are much alike, and cannot be told apart. The heterotypic divisions were studied in both the pollen mother cells and ovules of *O. lamarckiana*. In early prophase, the numerous chromatin threads are organized from the nucleolus. Synapsis occurs as in other plants. The lateral position of the nucleolus and network in the nucleus at this stage is not in the nature of artifact, but the author sees in it the possibility of a side by side fusion of chromatin threads that would be impossible were they to occupy a central position. The threads are in the form of a net, with many parallel loops joined by cross threads. It closely resembles the bouquet stage described in other forms, although the loops are not so regular. The chromatin material becomes concentrated in the center, and finally there emerge 7 clear chromatin bodies. This phase is particularly interesting, inasmuch as crossing over must occur at this time. Each chromosome is organized from a certain portion of the network. If a certain piece of thread that ordinarily makes up a part of chromosome A should become transferred to chromosome B, and an equivalent part should pass the other way, crossing over in a manner not incompatible with Morgan's theory of the linear arrangement of genes would be the result. In diakinesis, 7 double chromosomes are always clearly recognizable. These may be free from one another or joined in various ways, often giving the impression of a spireme. Contrary to the observations of most investigators, one never sees a spireme of 14 end-to-end chromosomes in earlier diakinesis. Telosynapsis probably does not occur. The double chromosomes differ in size. One is very large, 2 are nearly as large, and 4 are smaller. This confirms the theory of grouping of mutants upon a chromosomal basis put forward by de Vries and the author. Chromosomes now show a longitudinal split, and the univalent chromosomes making them up begin to separate. The 2 parts often remain with their ends still attached, forming rings. When separation is as complete as it will be, 14 single chromosomes may be seen. These may be variously joined, although an arrangement in pairs is still easily seen. The chromosomes

gradually grow smaller throughout diakinesis, but the typical features of diakinesis are not lost until the spindle is formed. Since chromosomes differ in size in diakinesis, it ought to be possible to determine, in 15-chromosome forms, what chromosome has been doubled.—*Ralph E. Cleland*.

5263. CAMPBELL, M. H. **Inheritance of black and red coat colors in cattle.** *Genetics* 9: 419-441. 1924.—The data obtained from matings between Guernseys and Holsteins conform to the hypothesis that black and red coat colors in cattle are an allelomorphic pair of characters, black being dominant. Three Holstein cows dropped red-and-white calves when mated with red-and-white males, showing that some purebred Holstein cattle carry the factor for red. The cross, Guernsey male $\times$ Holstein female, produced 88 black-and-white and 7 red-and-white calves. The reciprocal cross produced only black-and-white calves. Red-and-white $F_1 \times$ black-and-white F_1 produced 33 black-and-white and 31 red-and-white calves. Black-and-white $F_1 \times$ black-and-white F_1 produced 21 black-and-white and 8 red-and-white calves. The F_1 red-and-white coat color bred true.—*H. C. McPhee*.

5264. CAMPIN, M. G. **A chromosomal survey of certain plant families, with special reference to genetic relationships.** (Abstract.) *Rept. British Assoc. Adv. Sci.* 1923: 489. [1924.]

5265. CASTLE, W. E. **Some varieties of white rabbits.** *Jour. Heredity* 15: 211-219. *Fig. 9-17.* 1924.—There are several varieties of white rabbits different in appearance, and the geneticist finds that these varieties are also very different in regard to the young which they produce in crosses. Rabbits may be spotted, chinchilla, yellow grey, or silver, besides the usual white with pink eyes, and these represent different types of albinism. Some of these types of white or spotted rabbits are a good example of a genetic allelomorphic series, and others are independent.—*H. Cook*.

5266. CAYLEY, DOROTHY M. **The phenomenon of mutual aversion between mono-spore mycelia of the same fungus (*Diaporthe pernicios*a, Marchal). With a discussion of sex-heterothallism in fungi.** *Jour. Genetics* 13: 353-370. 2 pl. 1923.—This fungus gives rise to a rapid wilt and "die-back" of stone fruits. Aversion occurs between mono-mycelia from different hosts when grown together on artificial media. Aversion does not always occur when mono-mycelia are isolated from widely different hosts as apricot and plum or when the parasite is growing on the host. Miss Cayley's results throw no light on the constitutional differences of the various mono-spore strains. They show, however, that some strains are capable of completing all stages in the life-history and others not, and that the splitting up of monopycnospore cultures into a number of averting strains in the 1st ascospore generation can occur sometimes, but not always. Antagonism of this form seems to be quite unlike known cases of sex-heterothallism in fungi, such as in the *Mucors*. It is suggested that in *Diaporthe* it may only be a case of physiological strains and may have nothing to do with sex.—*Betty P. Watt*.

5267. CIFERRI, R. **Osservazioni sull' ereditarieta di un acarodomazio.** [Observations on the heredity of an acarodomatium.] *Atti Ist. Bot. Univ. Pavia Ser. III.* 1: 107-124. Pl. 7. 1924.—To get at the origin of the gall-like structures, it is necessary to examine budding leaflets. The effects on the leaf include, reduction or absence of stomata on the lower surface, cuticularization of the epidermis and more or less reinforcement of other tissue. Anatomical examination of young budding leaflets showed no trace of "galls," but the leaf tissue manifested already an alteration in its normal structure in the points corresponding to the position they would occupy later, as well as alteration in the chlorenchymatous tissues below the galls in the mature leaves. The article includes a discussion of the theories of various authors bearing on the question of symbiotic or other relation between the mites and other organisms and the plants harboring them. The author believes that the evidence from the examination of specimens of *Nectandra glabrescens* Benth. indicates hereditary formation of acarodomatia independently of the presence of the mite. The entire question is conceded to be controversial and in need of further experimental work.—*Helen Deuss Hill*.

5268. CLARKE, C. K., AND JOHN W. MACARTHUR. **Four generations of hereditary chorea.** *Jour. Heredity* 15: 303-306. 1924.—An investigation of the pedigree of a choreic family brought to light 37 cases of Huntington's chorea which appear to confirm the Mendelian nature of this disease. In each case the disease was transmitted directly from one choreic to

another, and no choreic parent failed to transmit the chores to at least some of his or her children—never to all of them. In general, at least $\frac{2}{3}$ of the children of a choreic and normal marriage have been choreic.—*H. Cook.*

5269. CLARK, J. ALLEN. Segregation and correlated inheritance in crosses between Kota and Hard Federation wheats for rust and drought resistance. *Jour. Agric. Res.* 29: 1-47. *Fig. 1-9.* 1924.—A genetic study from reciprocal crosses of Kota and Hard Federation wheats was made for the purpose of obtaining resistance to drought and rust in a high-yielding wheat of superior milling quality. The material was grown at Davis, California, under ideal conditions, St. Paul, Minnesota, under conditions of rust prevalence and at Mandan, North Dakota, under droughty conditions. No important maternal or paternal influence was found, although a slight influence was noted for certain characters. The inheritance of the awn was partially explained on a dihybrid Mendelian ratio in which 5 classes were studied. Neither the extreme awned nor awnless classes bred true in F_3 . Glume color was found due to 1 and kernel color to 2 genetic factors. Early heading was found dominant to late heading and tallness partially dominant but due principally to heterosis. Resistance to stem rust proved recessive and in F_2 appeared to occur close to a 1:15 ratio, but in F_3 none of the resistant F_2 strains bred true. Strains homozygous for resistance were obtained in F_4 . F_2 hybrids exceeded the parents in yield and variability. The quantity and quality of the gluten of F_4 hybrids were shown by the use of viscosity and crude protein in determination. Significant positive correlations were found between date of heading and percentage of stem-rust infection. Date of heading and yield were negatively correlated. The most important positive correlation obtained with yield was with height of plant. An important positive correlation obtained between stem-rust infection in 1922 and in 1923 proved that resistance was inherited.—*Author.*

5270. CONNER, A. B., AND R. E. KARPER. Chlorophyll deficiencies in sorghum. *Jour. Heredity* 15: 377-378. *Fig. 7.* 1924.—Investigation of albinism in sorghum shows that it is apparently a recessive character. No definite figures are given.—*H. Cook.*

5271. CREW, F. A. E. Blue and white color in swine. *Jour. Heredity* 15: 395-396. 1924.—In England, blue and white color in pigs is much esteemed. This type of pig is produced by mating Large Black and Large White, black-and-whites often being produced as well. To explain this situation the genetic formula *BbPPDd* is suggested, *B* being the factor for black, *b* for white, *P* for parti-colored condition, and *D* a dilution factor turning black into blue.—*R. C. Cook.*

5272. CREW, F. A. E. The glands that regulate sex. [Rev. of: LIPSCHUTZ, ALEXANDER. The internal secretions of the sex glands: the problem of the "puberty gland." With a preface by F. H. A. MARSHALL. xviii + 513 p. W. Heffer & Sons: Cambridge; Simpkin Marshall & Co.: London; Williams & Wilkins Co.: Baltimore, 1924.] *Nature* 114: 779-780. 1924.

5273. CUNNINGHAM, BERT. Inheritance of harelip. *Jour. Heredity* 15: 370. 1924.—A chart is given illustrating the inheritance of harelip for 2 generations. This information shows that the disease acts probably as a simple recessive, and is neither sex-linked nor sex-limited.—*H. Cook.*

5274. DOBZHANSKY, TH. Über den Bau des Geschlechtsapparats einiger Mutaten von *Drosophila melanogaster* Meig. [Structure of the sex apparatus of certain mutants of *Drosophila melanogaster* Meig.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 34: 245-248. 1924.—Careful measurements of certain organs of the ♀ and ♂ sexual apparatus in normal and mutant stocks of *Drosophila* were made. The results indicate fairly distinct and constant differences in size and other measurable characters between the wild and certain of the mutant stocks. For instance, the diameter of the cavity of the seminal receptacle of the ♀ in the ivory stock averages 1.871 ± 0.0008 while white-yellow is 1.343 ± 0.0005 . Similar constant differences appear in the number of egg rows in the ovaries, in the color of the testes, etc. These may be examples of the multiple effects of the mutant genes, or they may be due to other genes carried in the different stocks.—*H. H. Plough.*

5275. DOMM, L. V. Sex-reversal following ovariectomy in the fowl. *Proc. Soc. Exp. Biol. and Med.* 22: 28-35. 1924.—Cases of complete sex-reversal of ovariectomized Brown Leghorn females are described. The ovary was removed from some 60 individuals between the ages of 6 weeks and 6 months and subsequent development observed. A few took on a capon-like

appearance, but the majority developed distinctly ♂ characters, becoming cock-feathered, developing the comb, wattles and spurs as well as voice and psychological reactions of the ♂. In 2 cases cited where the individuals were distinctly male-like, post mortem examination showed an irregular testis-like body on the left side at the site of the ovary and associated with it one or more ovarian follicles. The oviduct was present but reduced. On the right side was a larger, elongated, more regularly outlined mass, testis-like in appearance, which upon histological examination showed a mass of tubules similar to seminiferous tubules of the immature cock. From this organ a small white strand resembling a vas deferens led posteriorly. Some ovariectomized individuals, which had become almost entirely male-like, are reported to be reverting to their original femaleness. The interpretation is that removal of the ovary was incomplete and that when a sufficient amount of ovarian tissue regenerated, a reversal toward femaleness was induced.—The conclusion is reached that the ♀, in this particular breed of fowl, "has many of the potentialities of the ♂ which are normally inhibited by the presence of the ovary, and that these potentialities can assert themselves approximately fully after the complete removal of the ovary at an early age."—*Margaret Schneider*.

5276. DUNN, L. C., AND G. B. DURHAM. **The isolation of a pattern variety in piebald house mice.** *Amer. Nat.* 59: 36-49. *Fig. 1-4.* 1925.—The isolation of a sub-variety of piebald (recessive white spotted) house mice is reported. In the new variety, called "white-faced piebalds," the dorsal white spotting is confined to the face. This type bred practically true through 14 generations of brother × sister matings. Attempted isolation of a uniform belted type of piebald failed, although selection through 8 inbred generations produced a true breeding type in which dorsal spotting is confined to the mid-dorsal region. Each type is subject to fluctuations in extent of spotting. Variability in amount of spotting was reduced under inbreeding. Crosses of white face and belt types produced chiefly white face in F_1 (36 out of 38). In F_2 there were 77 white face, 22 belt type, 22 white face and belt, and 2 with no dorsal spotting. White face was extracted unchanged from crosses with wild mice; the belt type was recovered after crossing with wild with about the same variability as characterized it in pure matings. The authors conclude that differences in localizations of spotting of piebald mice are genetic, probably due to modifying genes of which one (white face) shows dominance and segregation.—*L. C. Dunn*.

5277. EMERSON, R. A. **Control of flowering in teosinte.** *Jour. Heredity* 15: 41-48. *Fig. 23-27.* 1924.—Ordinarily teosinte, (*Euchlena* sp.) flowers so late in the northern U. S. A. that crosses with maize are difficult or impossible. Profiting by the work of Garber and Allard, it was discovered that plants given only 10 hours of daylight blossom much earlier than those exposed for the full length of day. In the case of teosinte and teosinte-maize hybrids, the difference was usually more than 2 months and for the sub-tropical maize varieties tested 1 month. It should be possible to start teosinte plants and to begin the short-day treatment at dates such that they will flower within perhaps 5 days, one way or the other, of any date in mid-summer that may be desired.—*H. Cook*.

5278. EYSTER, WILLIAM H. **Heritable characters of maize.** *Jour. Heredity* 15: 397-400. 1924.—The character discussed is called "polkadot leaves." The plants affected are normal green until about the time the tassel makes its appearance, when the margins of the leaves gradually become yellow. The yellow color spreads inwards towards the midrib. Polkadot leaves are inherited as a simple Mendelian recessive, probably in the *c-sh-wx* linkage group.—*H. Cook*.

5279. FLORELL, VICTOR H. **Studies on the inheritance of earliness in wheat.** *Jour. Agric. Res.* 29: 333-347. 1924.—This article contains data on the inheritance of earliness in a cross between 2 varieties of spring wheat (*Triticum vulgare*), with a brief review of literature on the subject. Other workers with this character have found earliness in wheat to be intermediate in the F_1 generation but inclined toward either one or the other parent; in the F_2 generation the population has been either with or without definite segregation. In subsequent generations, segregations into distinct classes becomes increasingly more definite as the heterozygotes disappear. Results obtained indicate that great complexity may occur in the constitution of the character of earliness as shown by data which require as many as 3 factors to explain inheritance. The indices used in noting earliness have varied considerably. Curves

are presented in this paper to show divergence of heading and ripening data among pure line varieties. Greatest divergence is shown in the date of 1st heading. The index of earliness used, therefore, in the F_2 plants was the data of appearance of the tip of the 1st spike. In the F_3 generation data were taken in a similar manner on "head" rows. The wheats crossed were Marquis (late) $\times$ Sunset (early). The F_1 generation was intermediate but possibly inclined toward the early parent; in the F_2 generation there was a distinct heaping up of the population into a large early and a small late group in the ratio 3.07:0.93, indicating 1 allelomorph pair of factors. The recessive late group of the F_2 remained late in the F_3 generation, which tended to confirm the above findings. Further evidence to support this view was indicated by the fact that more than $\frac{1}{2}$ of the F_3 population apparently was homozygous for earliness. Homozygotes (head rows) in F_3 were determined by the time required to pass through the heading stage. This measure of a homozygote for earliness is based on the assumption that pure line segregates pass through the heading stage in a time approximately equal to that of the pure line parent varieties. The time-temperature relation also was considered in this analysis.—*Author*.

5280. FRANCE. MINISTÈRE DE L'AGRICULTURE, INSTITUTE DES RECHERCHES AGRONOMIQUES. Décret relatif à l'organisation des services de phytogénétique. [Decree relative to the organization of plant genetic services.] Ann. Sci. Agron. Française et Étrangère 40: 281-285. 1923.—This decree, dated October 25, 1923, calls for an organization within the Institute for agronomic research efforts looking toward plant improvement. Central and regional stations are created. The central station is charged with the duties of (1) making a complete collection of the best varieties of cultivated plants, both of domestic and foreign origin, (2) collecting literature concerning plant genetics and (3) conducting with the aid of the regional stations, researches and experiments for determining the characters, adaptations, merits and defects of the best known varieties, or working toward the development of superior new varieties from those now existing. Independently of researches planned by the central station, the regional stations are, in accord with the departmental or regional agricultural offices, to conduct under practical conditions, tests with varieties whose culture it would seem ought to be recommended for the region. The decree further provides means of multiplication and distribution of the varieties whose merits have been demonstrated.—*A. B. Beaumont*.

5281. FRANCE. MINISTÈRE DE L'AGRICULTURE. INSTITUT DES RECHERCHES AGRONOMIQUES. Décret relatif à l'organisation des recherches agronomiques. [Decree relative to the organization of agronomic researches.] Ann. Sci. Agron. Française et Étrangère 40: 286-291. 1923.—This decree, under date of November 5, 1923, calls for the extension of the plan relative to plant genetics, approved in decree of October 25, 1923, to the following central stations: (1) Station of agronomy and biology of soils; (2) agricultural physics and meteorology; (3) microbiology; (4) entomology and agricultural parasitology; (5) phytopathology and vegetable parasitology; (6) animal technology; (7) researches in nutrition; (8) epizootics.—The functions of the various central stations are outlined.—*A. B. Beaumont*.

5282. FROLOWA, S. Die Ei- und Samenreifung bei *Chermes strobilobius* und *Chermes pectinatae*. [Oogenesis and spermatogenesis in *C. strobilobius* and *C. pectinatae*.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 29-56. 25 fig. 1924.—An attempt was made to determine the cytological life history of the aphids, *Chermes pectinatae* and *C. strobilobius*. The complicated 2-year life-cycle of these species is outlined. The cytology of *C. pectinatae* is fairly well worked out. Females have 20 chromosomes in their cells ($16 + 4X$). In oogenesis, in the case of those sexuparae which produce males, there is reduction in the number of sex chromosomes but not in the number of autosomes. The males, therefore, have 18 chromosomes ($16 + 2X$). In the primary spermatocyte, reduction in the number of autosomes occurs, and both sex chromosomes pass to 1 pole. The secondary spermatocyte which lacks sex chromosomes degenerates, that which develops further has the chromosome number, $8 + 2X$. In the 1st maturation division of the eggs of sexual females, reduction occurs, and the eggs possess the chromosome number, $8 + 2X$. These females, after fertilization, lay but 1 egg apiece, which becomes the stem-mother (*fundatrix vera*) with the chromosome number $16 + 4X$. The situation in *C. strobilobius* is not so clear. Females have 22 chromosomes.

The probable number in the somatic cells of the male is 18, but secondary spermatocytes show 10 chromosomes, or perhaps 11. It is not certain whether the number of sex chromosomes is 2 or 4 in the males, and 4 or 8 in the females. There is strong evidence in favor of the larger numbers.—*Ralph E. Cleland.*

5283. GATES, R. RUGGLES. *Species and chromosomes.* *Nature* 114: 353-356. 1924.—The relation of chromosome behavior to genetic behavior and mutations is pointed out. The changes which occur in the phylogeny of the chromosomes include polyploidy, fragmentation, fusion of chromosomes, diminution in size, irregular chromosome distribution and non-disjunction. Polyploidy has played an important part in species formation. The appearance of parallel mutations may be the basis of parallel phylogenetic changes in different lines of descent.—*Karl Sax.*

5284. GOWEN, JOHN W. *Studies on conformation in relation to milk producing capacity in cattle.* *Maine Agric. Exp. Sta. Bull.* 314. 69-96. *Fig. 23.* 1923.—This is a report of a study of conformation and milk yield in the light of the personal equation of the dairy cattle judge. Judging ability seems to be a generalized ability extending to each and every part of conformation which has value in determining milk yield. The good judge in contrast to the poor judge places his cows more nearly in their relative order of milk yield by the total score, fore udder, udder broad and level, rear udder, tail, and body shape. Even when the best judges are chosen, the correlation for the most important point for indicating milk yield is only 0.38. The 7-day milk record is about twice as valuable an indication of milk production over the full lactation period as is the conformation even when this conformation is determined by the best judges. In the absence of 7-day records the buyer should give particular attention to the points, milk veins, rear udder, total score, and udder size.—*H. C. McPhee.*

5285. GREENWOOD, A. W. *Marsupial spermatogenesis.* *Quart. Jour. Microsc. Sci.* (London), N. S. 67: 203-218. 2 pl. 1923.—Chromosome numbers were determined as follows: *Phascolarctus cinereus*, ♂ = 16 (14 + XY), ♀ = 16 (14 + XX); *Sarcophilus ursinus*, ♂ = 14 (12 + XY), ♀ = 14 (12 + XX); *Dasyurus maculatus*, ♂ = 14 (12 + XY). The sex chromosomes in all of these are smaller than the autosomes, the Y chromosome being especially minute. A detailed study of spermatogenesis in *Phascolarctus* was made. Syndesis probably occurs during synzesis. In late pachytene, the threads become diffuse, and lose their capacity for taking up the stain. Except in early stages of meiotic prophase, however, the sex chromosomes remain compact and deeply stained. The 1st meiotic division is reductional, X and Y chromosomes separating to opposite poles. There is no further reduction in the number of chromosomes in the 2nd meiotic division. The Y chromosome is not identifiable until metaphase of the 1st meiotic division. Various cytoplasmic inclusions are mentioned, including chromatoid bodies, the archoplasmic mass, and a structure identified by the author with the excretory granule of Gatenby. The structure of the Sertoli cells is described, together with certain experiments to determine the nature of the cytoplasmic rods, and which seem to indicate that these are not affected by the action of digestive fluids.—*Ralph E. Cleland.*

5286. HAGIWARA, TOKIO. *Genetic studies of flower-color in the morning glory.* (Japanese). *Bot. Mag. Tôkyô* 37: (37)-(62), (71)-(84). 1 fig. 1923.—Though the flower-colors of the morning glory are various, they may be classified into 4 groups: blue, purple, scarlet, and dark red, there being besides the yellow and white. The reason that there are so many varieties of color that we can not name them is owing to the fact that each color belonging to the 4 groups may be respectively deep or pale, dark or light, etc. The factors producing these colors are as follows: *C*, the fundamental color factor; *c*, that for white flower, *R*, that producing blue color with *C*, *P*, *B*; *r*, that producing dark red with *C*, both in the presence and absence of the other color factor; *P*, that producing blue color with *C*, *R*, *B*; *p*, that producing scarlet color with *C*, *R*; *B*, that producing blue color with *C*, *R*, *P*, but purple color with *C*, *R*, *p*; *b*, that producing purple color with *C*, *R*, *P*; *K*, that having the complementary relation to *C*, and causing color factors to develop the coloration with *C*; *k*, that not having the activity to develop the coloration with color factor, and probably producing yellow color with *Y*; *Y*, that concerning yellow ground color, and probably producing yellow with *k*; *y*, that concerning white ground color, and producing white with *k*. From this factor hypothesis, the genetical formula of these groups may be expressed as follows, only in respect to the corolla color:

blue color group, *BPRKC*; purple color group, *BpRKC*, *bPRKC*; scarlet color group, *bpRKC*; dark red color group, *bprKC*, *BprKC*, *BPrKC*, *bPrKC*.—The blue color group is the most epistatic, the dark red group the most hypostatic. From the description found in a certain old Japanese book about this plant and its genetic behavior, the author considers that the blue-colored race of this plant corresponds to purple "wild type" of sweet pea. The white flower is genotypically complex but phaenotypically simple; for example, according to this factor hypothesis the various genotypes of the white flowers not having the factor *Y* are 24. A coupling having the gametic ratio about 3.5:1:1:3.5 takes place respectively between each of the color factors, *b* and *P*, and the tube factor (*t*₁) which, in its turn, is linked with tube factor (*t*₂).—Moreover, a coupling having the gametic ratio about 70:1:1:70 takes place between the color factor referring to the scarlet color (*p*) and the tube factor (*t*₂). Depending upon the chromosome hypothesis these 4 factors may be located lineally on the same chromosome, in the order of *p*, *t*₂, *t*₁, *b*. Imai reported that a linkage having high intensity takes place between the factor for yellow leaf (*g*) and the factor for dark red color (*r*); therefore these 2 factors must be located nearby on the same chromosome. As it is considered that the relation between the factors *r*, *g* and *b*, *p*, is a free assortment, the color factor *r* may be on a different chromosome from the one on which the other color factors *b* and *p* are located.—*Author*. (*Courtesy Japanese Jour. Bot.*)

5287. HATAKOSI, TAKESI. Variation on the fructification in different races of potato. (*Japanese*.) *Idengaku Zasshi* [Japan. Jour. Genetics] 2: 103-106. 1923.—It is a well known fact that the fruiting power of potato plants is very weak. The following observations refer to various races of potato cultivated in the Agric. Exp. Sta. in Iwateken. The quantity of pollen produced varies greatly in different races. It is the general rule that in those which produce little, the proportion of imperfect pollen of small size is much larger than in those which produce it abundantly. In some races, such as Nagasakiaka, Akauma, etc., no flowers are produced at all, while in others, such as Snowflake they are produced but fall before opening.—Potato plants are rarely visited by insects so that the fertilisation is not entomophilous. In those races which produce much pollen, fruits may be formed naturally, though there are some exceptions. On the contrary, in those which produce little pollen they are formed naturally only on rare occasions; the author has artificially fertilized such races with pollen derived from those which produce much pollen, and has then found that in many cases fruits may be grown to a certain stage, but falls before ripening, except in the race Nemuro.—*Author*. (*Courtesy Japanese Jour. Bot.*)

5288. HAWKES, MRS. O. A. MERRITT. The ancestry of the Prince of Wales. *Jour. Heredity* 15: 275-290. *Fig. 1-12*. 1924.—The Prince of Wales has one of the most complete records of ancestry in existence. During the 1st 11 generations of the Prince's genealogy it would be possible for him to have had 2,048 ancestors, but due to inbreeding this number is reduced to 264 actual ancestors. A study of the results shows that inbreeding in this case has not been harmful. While inbreeding between cousins who have lunatic or feeble-minded ancestors is dangerous, the marriage of cousins with an average good quality of ancestors involves no danger, and may be the means of producing a superior group of individuals.—*H. Cook*.

5289. HAYES, H. K., AND D. W. ROBERTSON. The inheritance of grain color in wheat. *Jour. Amer. Soc. Agron.* 16: 787-790. 1924.—The Marquis wheat strain used in the White Bobs × Marquis cross has 2 independently inherited factors for red grain color. The Kanred and Minturki wheats used in crosses at the Colorado Agric. Exp. Sta. apparently have a 3rd factor for red grain color which is independent in inheritance of the factors for grain color found in Marquis.—*H. K. Hayes*.

5290. HEFNER, R. A. Inherited abnormalities of the fingers. *Jour. Heredity* 15: 433-439. *Fig. 10-18*. 1924.—The inheritance of short thumbs, brachymegalodactylism, is believed to be a pure Mendelian dominant. The seat of the anomaly lies in the terminal phalanx of the affected thumb.—*H. Cook*.

5291. HEFNER, R. A. Inherited abnormalities of the fingers. *Jour. Heredity* 15: 481-483. *Fig. 3-5*. 1924.—Subterminal articulation in the proximal joint of the little finger is described as a peculiar crooking of the little finger at the proximal joint when the other digits

are straightened. No data given as to the mode of inheritance of this trait, although it is apparently hereditary.—*H. Cook.*

5292. HEFNER, R. A. *Symphalangism*. Jour. Heredity 15: 323-328. Fig. 1-6. 1924.—Symphalangism is defined as congenital ankylosis or fusion of the proximal phalangeal joints of some of all the fingers of both hands. The trait is inherited as a Mendelian dominant.—*H. Cook.*

5293. HERSH, AMOS H. *The effect of temperature upon the heterozygotes in the bar series of Drosophila*. Jour. Exp. Zool. 39: 55-71. 4 fig. 1924.—Flies heterozygous for genes of the bar series of multiple allelomorphs are intermediate in facet count between flies homozygous for the temperature range 15-31°C. Like homozygous flies, heterozygous flies show an exponential decrease for facet count with increase in temperature. On the basis of facet counts ultra bar is the more dominant gene; full, the less dominant; and 27°C. is the critical temperature for this dominance.—*H. H. Plough.*

5294. HOVASSE, R. *Contribution à l'étude des chromosomes. Variation du nombre et régulation en parthénogénèse*. [Contribution to the study of chromosomes. Variation in number and regulation in parthenogenesis.] Bull. Biol. France et Belgique 56: 141-229. Pl. 1-2, fig. 1-20. 1922.—This article supports the theory that chromosomes are transitory bodies appearing at the prophase much as crystals appear in a solution and lose totally their individuality at the telophase as crystals disappear in a solution when heated. This idea is directly opposed to the theory of chromosome individuality as put forth by Boveri. A study of the chromosome number in hundreds of cells of embryo frogs (*Rana temporaria* L.) from 4-84 hours old produced parthenogenetically and by normal fertilization gave the data from which his conclusions are drawn. In parthenogenetically produced embryos about 50% of them had readjusted their chromosome number to approximately the $2n$ condition. In embryos both parthenogenetically produced and those produced by normal fertilization there exist cells that are not truly $2n$ but vary around this number. The author attaches to these findings, that have been purposely disregarded by some authors, an importance sufficient to overthrow the theory of the individuality of the chromosome and replace it by the view that the chromosome number is controlled by a physical mechanism that brings about an equilibrium between chromatin of the nucleus and the cytochromatin existing in the cytoplasm.—*A. E. Longley.*

5295. HURST, C. C. *On the chromosomes of Rosa*. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 489. [1924.]

5296. HUXLEY, J. S. *Sex-determination and related problems*. Med. Sci., Absts. and Rev. 10: 91-124. 1924.—The paper is itself essentially a compilation or review of abstracts and can not be abstracted satisfactorily. It contains a good review of studies dealing with the chromosomal basis of sex. It is recognized that the chromosomal control of sex is not absolute, but may be overridden by other agencies. On human sex-determination it is concluded that so far as is known, the sexual fate of the individual human being is normally determined at the moment of fertilization. No undoubted exceptions to this rule are known. Although certain exceptions are theoretically possible, they must certainly be of extreme rarity. The only method of controlling sex-ratio in man which can at present be theoretically imagined would be one depending on artificial separation of the 2 types of spermatozoon, followed by artificial insemination with 1 type only. Transformation of sexual instincts is possible through castration followed by engrafting of heterologous gonad tissue. Genetically-determined intersexual individuals occur in man and must be assigned to a 3rd sexual category.—*Oscar Riddle.*

5297. IMAI, YOSHITAKA. *Genetic studies in morning glories. X. Behavior of defect leaf and "Gejigeji" variegation in Pharbitis Nil*. (Japanese.) Bot. Mag. Tôkyô 38: (59)-(65). 1 fig. 1924.—In the progeny of a plant unknown origin the author obtained some individuals having a few defective leaves mixed among the normal ones. The defective parts of the leaves were quite irregular in form. This irregularity may sometimes appear even in the cotyledons. The defective parts are often accompanied by a very faint variegation which may be mistaken for a symptom of disease. This abnormality was proved by the author's experiments to be Mendelian recessive to the normal. Besides the ordinary abnormal forms which have a few

defective leaves among the normal ones, there occur some false normals with perfectly normal leaves, but carrying the defective factors in full dose. Such false normals behave in the same way as the ordinary defectives, giving rise in their self propagated progenies to many defective and a few false normals. From the data obtained the author found that the rate of appearance of the false normals is about 13%, although the value may be expected to vary with the conditions under which the plants are raised. In some crosses of green and common variegated leaves there appeared some "gejigeji" or ghost variegateds in the F_2 generation, the ratio of 3 forms—green, common variegated and "gejigeji"—being a 12:3:1. This result suggests that the "gejigeji" marking is a variegated leaf differing in 1 recessive factor from the normal variegated. The characteristic of the "gejigeji" leaves is the peculiar one of resembling somewhat the faint variegation of the defective leaves.—*Author. (Courtesy Japanese Jour. Bot.)*

5298. JONES, D. F. Methods of seed corn production being revised. *Jour. Heredity* 15: 291-298. *Fig. 13-19.* 1924.—Investigations showing that inbreeding is the most effective method of developing and perpetuating the desirable characteristics in seed corn will radically change methods of seed corn production. After 4 or 5 generations of self-fertilization a strain becomes fixed in size and in type and from then on there is little change. Crossing certain of these self fertilized strains produces F_1 plants of exceptional vigor and productivity.—*H. Cook.*

5299. KARPECHENKO, G. D. Hybrids of ♀ *Raphanus sativus* L × ♂ *Brassica oleracea* L. *Jour. Genetics* 14: 375-396. *Pl. 21-22, fig. 1-3.* 1924.—The F_1 hybrids showed considerable variation in vigor, habit of growth, leaf shape and color of flowers, but were uniform in regard to structure of flowers and fruit pods. Species of both genera have 9 pairs of chromosomes. Mitosis in F_1 proceeds normally but in meiosis the chromosomes fail to pair and are distributed at random to the daughter cells of the 1st meiotic division. Some normal pollen tetrads were formed, other pollen mother cells produced groups of microspores ranging in number from 2 to 7. A few pollen grains matured. One normal stage was observed in an embryo-sac syndesis mother cell. No completed embryo-sac cells were found. The F_1 proved to be completely sterile in crosses *inter se* and back to parents. The reciprocal cross *Brassica* × *Raphanus* failed to produce viable seed.—*J. L. Collins.*

5300. KEUNEKE, WILLI. Über die Spermatogenese einiger Dipteren. [Spermatogenesis in certain diptera.] *Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre* 1: 357-412. 3 pl., 9 fig. 1924.—Spermatogenesis was studied in the following species: *Tephritis arnicæ* L., *Calliphora erythrocephala* Meigen, *Sphaerophoria scripta* L., *Lucilia caesar* L., *Sarcophaga carnaria* L., *Musca domestica* L., and *Scatophaga stercoraria* L. In all of the species studied, the various chromosomes differ from one another in 3 ways. (1) In size and shape. The chromosome pairs are all different. The characteristic shapes are maintained through the various spermatogonial divisions, and also through the maturation divisions, so that the individual chromosomes can be recognized in every figure. (2) Some of the chromosomes have a tendency to break up into smaller parts. They differ among themselves with respect to this tendency, some showing a stronger tendency than others, and some displaying none. Actual breaking up is the exception rather than the rule, although the tendency is often shown by the presence of cross fissures. (3) The chromosomes vary in the time at which they show the longitudinal split. In some, the split always appears early, in others, not until later; and the order in which it occurs in the various chromosomes is constant. Strong evidence for belief in the continuity of chromosomes is furnished by the fact that in *Sphaerophoria* and *Lucilia* the chromosome pairs can be clearly distinguished throughout the entire growth period, as well as between the maturation divisions. In the spermatogonial divisions, homologous chromosomes are closely paired, especially in the last. During the prophase of the 1st maturation division, there is no bouquet stage, and no synapsis, inasmuch as the homologous chromosomes, when they emerge from the resting stage are already paired. The chromosomes are divided longitudinally in both the 1st and 2nd maturation divisions. It is often difficult, therefore, to decide whether the autosomes are reduced in the 1st or 2nd division. In *Musca domestica*, it seems clear that the 1st division is reductional, and evidence points toward this being the case in the other species also. Heterochromosomes were observed in 6 of the

7 species. In 5 of these, they are of the XO type, but in *Tephritis arnicae*, they belong to the XY type. In the single remaining species, *Sphaerophoria scripta*, the chromosomes in all of the pairs are alike, so that it is impossible to tell which is the sex chromosome. In those species with the XY type, the 1st maturation division is reductional for the heterochromosomes, but in the one which has the XO type, reduction occurs in the 2nd division. A basis for crossing over is seen in the tendency of certain chromosomes to fragment. The parts thus separated act as individual chromosomes, so that this phenomenon might easily result.—*Ralph E. Cleland.*

5301. KOEHLER, O. Ueber die Vererbung der Vielfingrigkeit beim Menschen. [The inheritance of polydactylism in man.] Biol. Centralbl. 43: 646-672. 14 fig. 1924.—The conclusion is reached that the occurrence of polydactylism is determined in at least 2 ways. First, there is a genotypic hereditary factor lying in an autosome; 2nd, some kind of accessory factors facilitate its ontogenetic expression. In 1 family, for example, the facilitator is the maleness of the individual that carries the factor; in all other cases ♂ and ♀ carry the factor alike; but prevailingly, the ♂. In other words, secondary external factors determine whether the (dominant) polydactylism shall be expressed or not. Syndactylism is inherited like polydactylism.—*C. B. Davenport.*

5302. KUSCHAKIEWITSCH, SERGIUS. Über Allochromosomen bei der Spermiogenese der Prosobranchier. [Allochromosomes in the spermatogenesis of Prosobranchs.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 499-506. 1 pl. 1924.—In various species of snails, bodies called "allosomes" or "allochromosomes" are described as present in the nuclei of spermatogonia and spermatocytes. Their number is either 1 or 2 in a nucleus. They are in the nature of heterochromosomes, but are described as dividing equationally in both maturation divisions; this is in contrast to the autosomes, which are reduced.—*Ralph E. Cleland.*

5303. LENZ, FRITZ. Eugenics in Germany. Jour. Heredity 15: 223-231. 1924.—The war and the period of upheaval which followed it have put a serious check on the advancement of eugenics in Germany. However new eugenic agencies are coming into existence which stimulate interest and a higher moral attitude. On the legislative side everything remains to be done.—*H. Cook.*

5304. LONGLEY, A. E. Chromosomes in maize and maize relatives. Jour. Agric. Res. 28: 673-682. Pl. 1-3. 1924.—The haploid chromosome number in several genera of the tribe Tripsacaceae are reported. *Euchlaena perennis*, *Euchlaena mexicana*, *Zea*, *Coix* and *Tripsacum* have respectively 20, 10, 10, 10 and 35 bivalent chromosomes at diakinesis. The significance of chromosome number as indicative of the origin of *Zea mays* is discussed. Chromosome behavior in F₁ plants from the bigeneric cross, *Zea mays* × *Euchlaena perennis*, is described. It affords a favorable opportunity to note the union of the 20 chromosomes of 1 parent with the 10 of the other parent. These 30 units combine at diakinesis giving trivalent, bivalent and a few uncombined or univalent chromosomes. The distribution of the 30 chromosome elements at meiosis is very irregular and the large amount of sterile pollen in these hybrids may safely be attributed to this fact.—*Author.*

5305. MARCOVITCH, S. The migration of the Aphididae and the appearance of the sexual forms as affected by the relative length of daily light exposure. Jour. Agric. Res. 27: 513-522. 1924.—In *Aphis forbesi* short exposures to light hastened the appearance of sexual forms, while long exposures inhibited their production. By subjecting the secondary or summer hosts of *Aphis rumicis*, *Aphis sorbi*, and *Capitophorus hippophaes*, to a shortened length of daily exposure to light, fall migrants and males were produced several months earlier than under natural conditions. Experiments with *Aphis sorbi* indicate that the short days of fall stimulate production of fall migrants, and the lengthening days of spring that of spring migrants. Garner and Allard found that sexual reproduction in higher plants is stimulated by definite day length and that this is correlated with chemical changes in sap. It is suggested that these changes cause sex production and migration in Aphididae.—*Anna R. Whiting.*

5306. MAVOR, JAMES W. Gynandromorphs from x-rayed mothers. Amer. Nat. 58: 525-529. 1 fig. 1924.—Among 68,000 F₁ offspring from x-rayed mothers (*Drosophila*) there have appeared 4 gynandromorphs while none have been observed among about the same number

of controls. If x-rays induce gynandromorphs as well as non-disjunction, the fact supports the Morgan-Bridges theory of the method of occurrence of such anomalies.—*H. H. Plough.*

3507. MAVOR, JAMES W., AND HENRY K. SVENSON. Crossing over in the second chromosome of *Drosophila melanogaster* in the F₁ generation of x-rayed females. *Amer. Nat.* 58: 311-315. 1924.—Tests of F₁ females from progenies of *Drosophila* derived from mothers which have been subjected to x-ray treatment indicate that the increased crossing over induced in the mothers is not transmitted. This corresponds with the results previously obtained by Plough for temperature effects on crossing over.—*H. H. Plough.*

5308. MIKI, TAIDI. Number of seed in the fruit of *Citrus nobilis* Lour. var. *unshiu* Swingle. (Japanese.) *Idengaku Zassi* [Japan. Jour. Genetics] 1: 173-184. 1923.—*Citrus nobilis* var. *unshiu* produces only a small quantity of pollen with very weak germinating power or often no pollen at all, and consequently fruits of parthenocarpous origin are generally produced; but, as pistils are partially fertile, some seed are often produced. In order to study the variation in the number of seed in this variety the author has cultivated it in a garden, together with a number of seed-producing *Citrus* species or varieties; besides, he has performed artificial crosses with pollen of the latter. As the results of a number of observations he has found in the former 1-10 seed for each fruit, their average number per fruit being 1.028. In the case of artificial pollination the number of seed is considerably larger; their number is 0-13 for each fruit, or 3.610 per fruit on the average.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5309. MOREAU, FERNAND ET MME. FERNAND MOREAU. Sur une liane hermaphrodite de Houlblon. [A hermaphrodite hop.] *Bull. Soc. Bot. France* 69: 591-594. 1922.—The vine is noteworthy for its vigorous growth. Normal ♀ inflorescences dominate. They appear larger than those found in the region of Strasbourg. In addition there are andromorphic inflorescences differing from the former mostly by smaller size and possession of stamens. Gynomorphic inflorescences, always small, are found. The authors think that further interest attaches to the possibility such plants offer of securing pollen of known origin for fertilizing female flowers of the same clone.—*Helen Deuss Hill.*

5310. MUNERATI, OTTAVIO. Contribution à l'étude de la constitution génétique de la betterave à sucre actuelle. [Contribution to the study of the genetic constitution of the sugar beet.] *Congr. Internat. Agric. Paris XI.* 2: 72-78. 1923.—The wild beet presents analogies to the cultivated sugar beet, while the forage and garden beets differ. The sugar beet should be considered as a genetic entity of hybrid nature. Otherwise, the following facts could not be explained: The appearance of individuals that approach the forage type or wild type, genetic differences in progeny, and the necessity of continuous selection to conserve desirable attributes of the sugar beet.—*Helen Deuss Hill.*

5311. MUNERATI, OTTAVIO. The subdivision of individuals in genetic research. *Internat. Rev. Sci. and Pract. Agric.* [Rome] N. S. 2: 22-26. 3 pl. 1924.—The author discusses the advisability of subdivision of individuals in genetic research, especially in the field of sterility, in the study of the effect of environment, inbreeding, acclimatisation, and adaptation. He considers it especially applicable to the cereals, even maize, beets and carrots. Methods in use at Rovigo Exp. Sta. are given.—*J. Ben Hill.*

5312. NAKATOMI, SADAÔ. Differences of chromosomes in various races and mutants of rice. (Japanese.) *Idengaku Zassi* [Japanese Jour. Genetics] 2: 107-115. 2 fig. 1923.—The author has studied the nuclear division of the pollen mother-cells in various races of rice, including foreign and Japanese as well as anomalous (produced by mutation)—altogether 21 races. The general conclusions arrived at are that the haploid number of chromosomes is 12 and that the size of chromosomes varies more or less in different races.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5313. NEUMANN, M. P. Unsere Weizenzüchtung und die Backfähigkeit der Sorten. [Our wheat breeding and the baking value of varieties.] *Beiträge Pflanzenzucht.* 7: 1-7. 1924.—Different opinions ascribed to American, English and German authorities relative to the comparative influence of heredity and environment upon the technical values of wheat, are set forth. The characters evaluating the technical value of a wheat are weight per bushel, absolute weight of grain, size of grain, protein content, and finally, the baking test, which is the most important.—*L. R. Waldron.*

5314. NILSSON-EHLE, H. Einige Züge aus der Entwicklung des Mendelismus. [Some features in the development of Mendelism.] *Naturwissenschaften* 12: 757-761. 1924.—The author traces the growth in the nearly universal application of Mendelian inheritance during the 20 years of work since its discovery. The 2nd main part discusses the work of Morgan on the mechanism of heredity. The 3rd part deals mostly with the future, and is concerned with learning about the nature and origin of Mendelizing genes. The 4th direction in which Mendelism points is toward the distinguishing of heritable characters from those due to environment. A generalized review, especially emphasizing the work of Correns in opening new vistas in Mendelism, follows.—*J. Ben Hill.*

5315. NISBET, R. H. Dr. Kammerer in Cambridge. *Sci. Prog.* 19: 126-127. 1924.—The author replies to MacBride's criticism of Thacker's report of Kammerer's lecture in Cambridge, on the subject of the inheritance of acquired characters. MacBride's rejoinder is printed on the next page, where he clearly states his belief that "inheritance of function" has been proved and that mutations are all "due to a pathological process of 'germ weakening' which would unfit their possessors to survive in the struggle for existence."—*M. N. Pope.*

5316. PAINTER, THEOPHILUS S. Studies in mammalian spermatogenesis. V. The chromosomes of the horse. *Jour. Exp. Zool.* 39: 229-247. 2 pl., 27 fig. 1924.—A re-examination of carefully prepared testis material from the horse, and a comparison with the writer's work on other mammals, suggests a considerable change in the current descriptions of horse spermatogenesis. The number of spermatogonial (diploid) chromosomes is 60 (or more) while that of the spermatocytes (haploid) is 30. The sex chromosomes are believed to be of the X-Y type, but the pair are of very unequal size. The horse material is the most difficult studied by this writer, but it is believed to show the same chromosome behavior as the marsupial and primate, including man.—*H. H. Plough.*

5317. PAINTER, THEOPHILUS S. The sex chromosomes of man. *Amer. Nat.* 58: 506-524. 22 fig. 1924.—A general discussion and critical review of the evidence bearing on the type of sex chromosome complex in man is given, based on the published work of the author and of other cytologists. Agreement has now been reached that the haploid chromosome count in man is 24 (material from males of several races). The male diploid count may be either 47 or 48 depending on whether sex chromosomes are of X-Y or X-O type. Direct evidence is adduced from diploid and haploid counts, from the morphology of chromosomes in reduction and 2nd maturation division and from the character of the female chromosome complex, to show that the X-Y type occurs in man; this is supported by similar evidence from the monkey, horse, opossum and several other marsupials, showing that the X-Y type is common in other mammals, and by genetic evidence tending toward the same conclusion. On the author's interpretation, the male diploid chromosome set is $46 + X + Y$; the female diploid, $46 + 2X$.—*Margaret Schneider.*

5318. PRELL, HEINRICH. Das Problem der Blütenfüllung bei *Matthiola annua*. [The problem of doubleness in *Matthiola annua*.] *Zeitschr. Induct. Abstamm.- u. Vererb.* 35: 286-291. 1924.—The existence of normal single races of stocks which breed true is thought to be inconsistent with the hypothesis of a gametic lethal factor linked with the singleness factor which has been used to explain the breeding behavior of double throwing single races. In order to avoid this difficulty the author postulates the following factorial condition: $E = \text{singleness}, e = \text{doubleness}, \lambda_1$ absolutely linked with E, λ_2 with e . Diplonts with $\lambda_1 \lambda_2$ produce a substance that is harmful to pollen while still in the anther. A factor K , absolutely linked with e makes haplonts containing it especially viable. In double throwing single races only σ gametes with K , hence with e , survive. K also determines to some extent which megaspore gives rise to the embryo sac, hence 9 doubles: 7 singles instead of 1:1.—*M. M. Lesley.*

5319. REDFIELD, HELEN. A case of maternal inheritance in *Drosophila*. *Amer. Nat.* 58: 566-569. 1924.—A case of "maternal inheritance" shows itself in a newly isolated lethal factor. This is inherited through both sexes, but acts only on females. Its interest from the point of view of maternal inheritance is that no lethal effect is produced except where the lethal gene is introduced through the mother. This apparently suggests a difference in the cytoplasm, such that certain chromosome combinations (that is, XX) are lethal in reaction with it. Such a demonstration seems of significance from the point of view of species incompatibility.—*H. H. Plough.*

5320. REES, E. M. **Chromosomes and sterility in Muscari.** (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 489-490. 1924.]

5321. RIDDLE, OSCAR. **The comment on sex in pigeons contained in Gerould's paper on butterflies.** Amer. Nat. 59: 79-87. 1925.—In *Colias* Gerould found a precocity of male-producing eggs which is based upon the more rapid development of ♂ than of ♀ embryos. His attempt to find something comparable with this precocity in pigeons was misdirected. Instead of making the comparison with "rate of development of ♂ and ♀ embryos" in pigeons—where no such difference has been reported—the comparison was made with 2 other quite different situations involving the order of sex production in pigeons. In his examination of the data of Whitman and of Riddle on these 2 points Gerould found and cited only a fraction of the available data; the conclusions drawn are shown to be erroneous. A tabulated summary of the data earlier published on the sexual output of the 2 eggs of the pigeon's clutch is provided.—*Author.*

5322. ROBERTS, J. A. FRASER. **Colour inheritance in sheep. I. Black colour and badger-face pattern in Welsh Mountain sheep.** Jour. Genetics 14: 367-374. Pl. 19-20. 1924.—Black coat color appears to be dominant to white coat color in Welsh Mountain sheep. Frequently a type of pattern known as "badger-face" appears in flocks of this breed. This pattern consists essentially of a restriction of black to the ventral surface of the body, inner surface of legs and tail, lower jaw and throat, inside of ears, and 2 bars between the eyes. The inheritance of this type of pattern suggests that it is due to a single factor, recessive to white. It is tentatively suggested that black is epistatic to the badger face pattern.—*H. C. McPhee.*

5323. ROSENBERG, V. **Unregelmässigkeiten und andere Beobachtungen bei Erbsenbastardierungen.** [Irregularities and other observations on hybridization in peas.] Zeitschr. Pflanzenzucht. 10: 59-62. 2 fig. 1924.—Crosses between a white-flowered winter pea with black-eyed seed and Victoria, a variety without the black-eyed character, gave unexpected and unusual results in the F₁ generation. Black-eye, as shown by Vilmorin, Kajanus and others is dominant over colorless eye (hilum). The 1921 F₁ results from the above mentioned cross gave in some cases (65.52%) the usual dominance of black-eye; in other hybridizations, part of the plants bore colorless seed, while others bore black-eyed seed (8.62%); in still other hybridizations (15.52%) F₁ plants bore on the same plant both colorless and black-eyed seed; while in 10.34% of the total hybridizations, F₁ plants with only colorless seed were produced. Similar results were again secured in 1922, except that no examples of the 2nd case noted above were found. In all cases, the black-eyed seed were smaller in size than those with white or colorless eyes. Further, plants from black-eyed seed were more likely to survive the winter, while those from white-eyed seed usually died. The irregularities described above were also found in F₂. In 4 cases, F₁ plants with white-eyed seed had black-eyed F₂ progeny. Crosses between this same black-eyed pea variety and another white-eyed pea variety gave F₁ plants with only black-eyed seed.—*Orland E. White.*

5324. SAITO, SYŪITI. **The genetics of *Setaria italica*.** (Japanese.) Idengaku Zasshi [Japan. Jour. Genetics] 2: 67-70. 1 pl. 1923.—I. What are called "stiff hairs" in *Setaria italica* are the bristles which are found near the lower ends of each grain, and which are developed from the upper extremities of the spikelet stalk. Their number for each grain varies from 2 to 9. They are either long or short. Long × short gives long, and in F₂ the segregation follows the monofactorial type.—II. In general the branches of the panicle are very short, and not conspicuous, so that the whole panicle resembles in some respects the tail of some animals. In one race each panicle is provided with a number of long conspicuous branches. The hybrids between these 2 types possess the panicle of the latter. In F₂ besides both parent types various intermediate ones occur whose exact classification is somewhat difficult, but if we classify them into ordinary type and type with more or less conspicuous branches, we observe the 9:7 segregation, that is, we have here to deal with a dihybrid segregation. It is clear that various intermediate types of panicle are chiefly due to various combinations of 2 factors.—III. The grain color is various—orange, yellow, red, black, etc. The hybrid, red × orange, gives orange. In F₂ we have orange: red: yellow = 12:3:1, though orange and yellow are often scarcely distinguishable. The author's conclusion is as follows: A = red, a = yellow, B = orange, b = yellow, and A is epistatic to B.—*Author.* (Courtesy Japanese Jour. Bot.)

5325. SANTOS, JOSE K. **Determination of sex in Elodea.** Bot. Gaz. 77: 353-376. Pl. 23-27, fig. 1-8. 1924.—The reduction divisions in *Elodea canadensis* agree in nearly all respects with those of *E. gigantea* previously studied [see Bot. Absts. 13, Entry 749]. The m and f chromosomes are evident when the bivalent chromosomes emerge from the 2nd contraction. The giant L chromosome splits lengthwise and forms 2 large daughter chromosomes while the m and f constituents of the unequal pair separate from each other. The m chromosome goes to 1 pole and the f chromosome to the other. In the 2nd division all daughter chromosomes divide equally, 2 of the 4 granddaughter nuclei having an equal share of the m chromosome, and the other 2 an equal share of the f chromosome from the unequal pair. The 2 microspores that receive the smaller amount of chromatin are slightly smaller than the 2 that receive the larger amount. The 4 microspores from 1 pollen mother cell do not fall apart, but remain attached and are ultimately shed from the sporangium, still joined together. There are 48 somatic chromosomes in the ♂ sporophyte, 2 being larger and 1 smaller than the rest. The ♀ sporophyte also contains 48 chromosomes of which 2 are larger than the rest, and correspond in size with those of the ♂.—*Wanda Weniger*.

5326. SAX, KARL, AND HALLY J. SAX. **Chromosome behavior in a genus cross.** Genetics 9: 454-464. Pl. 1-2. 1924.—*Aegilops cylindrica*, with 14 haploid chromosomes, was crossed with *Triticum vulgare*, (variety Marquis) which has 21 haploid chromosomes. In the F₁ there are approximately 7 pairs of chromosomes and 21 single chromosomes at the time of the 1st reduction division of the pollen mother cells. Chromosome incompatibility and irregular chromosome distribution is apparently the cause of the almost complete sterility found in F₁. The possible origin of cultivated wheats from crosses of *Aegilops* with wheat varieties of the Emmer group is discussed.—*Karl Sax*.

5327. SCHARNAGEL, TH. **Die Bekämpfung von Pflanzenschädlingen durch Züchtung, unter besonderer Berücksichtigung des Getreides.** [Combating plant diseases and animal pests by breeding, with special consideration of grains.] Beiträge Pflanzenzucht 7: 40-54. 1924.—The necessity of producing varieties resistant against important plant diseases and insect pests is emphasized. The latter effect may be produced by breeding for general vigor, earliness, regeneration ability or chemical differences. One pea variety was found to resist the attacks of *Sitones lineatus* on account of its acidity. Results in breeding for resistance against insects in other crops was less successful.—*L. R. Waldron*.

5328. SCHEIDT, W. **Beiträge zur Geschichte der Anthropologie. Der Begriff der Rasse in der Anthropologie und die Einteilung der Menschenrassen von Linné bis Deniker.** 3. Von Lamarck bis Darwin. [Contributions to the history of anthropology. The idea of race in anthropology and the division of human races from Linnaeus to Deniker. 3. From Lamarck to Darwin.] Arch. Rass.-u. Gesellschaftsbiol. 16: 178-202. 1924.—From Linnaeus to Cuvier the monogenesis of man was accepted, modifications being explained by conditions of life; and a mechanism for such modifications was supplied by Lamarck, who recognized Caucasians, hyperboreals, Mongols, Americans, Malays and Aethiopians. During the middle of the 19th century polygenesis of mankind became more generally postulated. Gobineau's work stressed the inequality of human races. Darwin turned the tide toward monogenesis, and explained racial diversity on the ground of adaptation.—*C. B. Davenport*.

5329. SCHLOESSMANN, H. **Die Hämphilie in Württemberg.** [Haemophilia in Württemberg.] Arch. Rass.-u. Gesellschaftsbiol. 16: 129-161, 276-303. 1924-1925.—An extensive, still uncompleted pedigree of 24 families of Württemberg that carry the "bleeding" tendency is given and also extensive pedigree charts of 100-300 individuals, through 6 generations. The evidence seems clear that ♀ carriers show abnormally insufficient capacity for coagulation of the blood though they are not typical bleeders.—*C. B. Davenport*.

5330. SUGIMOTO, SIGEO. **Some examples of the production of anomalous races in rice.** (Japanese). Idengaku Zasshi [Japanese Jour. Genetics] 2: 71-75. 1923.—(1) In general the dwarf race of rice is genetically recessive to the typical one. Certain offspring derived from the races Sekitori × Aikoku made in 1901 were cultivated for some years, and have bred true. In 1910 one dwarf plant has appeared among them (on the average, original type 1.1 m. high; dwarf type, 0.7 m. high). In 1921 the result has been dwarf: ordinary in a 3:1 ratio, so that it may be considered that the original dwarf plant has appeared as a monofactorial heterozygote, owing to the mutation of

1 of the 2 recessive genes of an allelomorphic pair to the dominant one.—(2) In 1919 the author found among almost 30,000 individuals of a pure line of the race known by the Japanese name Wasesinriki No. 1, one dwarf plant. In 1920 the latter has given rise to ordinary and dwarf offspring in a 3:1 ratio, which was confirmed by F₂ culture. It may be seen from such results that the appearance of this dwarf plant is due to the mutation of 1 of the 2 dominant genes of an allelomorphic pair to the recessive and that it has appeared 1st as the monofactorial heterozygote. This case is just the reverse of what was described under (1).—(3) In one anomalous race secured by the author, flowers are produced only at the apex of side branches and are longer than usual; anthers are flat and contain no pollen, pistils have no stigmas, and consequently the race is quite sterile. It first appeared in 1919 as the offspring of an ordinary fertile plant, that is, composed of 21 ordinary and 8 anomalous types, that is, almost in a 3:1 ratio. The further cultivation of some offspring of the ordinary type in 1920 has given rise again to ordinary : anomalous in a 3:1 ratio. The author thinks that this anomalous plant arose as a heterozygote in 1918, but owing to the dominancy of the ordinary type it became visible first in 1919.—(4) In 1919, among nearly 30,000 offspring in a pure line of the race, Wasesinriki No. 1, 2 anomalous races were discovered. One of them is characterised by the fact that the grains are longer and more loosely arranged on the axis than usual, while in the other they are shorter and more densely arranged than usual. Both races immediately bred true to their respective types.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5331. SUMNER, F. B. **Hairless mice.** Jour. Heredity 15: 475-481. Fig. 1-2. 1924.—Hairless sports have been observed by a number of previous writers in the house-mouse and the Norway rat. Very little genetic work has hitherto been done on them, owing to infertility and high mortality. The character has appeared twice, independently, in the author's stock of *Peromyscus maniculatus gambeli*. The young acquire the 1st coat of hair, but lose this within a few weeks. In adult life, the skin commonly becomes conspicuously wrinkled. The claws are generally much elongated, but the teeth are normal. The ears are unpigmented at the base, as if hair were present. Hairless females are usually, but not invariably, sterile. Most of the young were secured by mating hairless males with heterozygous females. Potassium iodide treatment, such as has been applied successfully to mothers of hairless pigs, proved wholly ineffective, both when administered to mothers and to growing young. This character is a regular Mendelian recessive, there being, however, deficient numbers of hairless animals, owing probably to low viability of these during early development. No sex-linkage, and no linkage with albinism was revealed by the rather inadequate breeding experiments.—*Author.*

5332. SUMNER, F. B. **The stability of subspecific characters under changed conditions of environment.** Amer. Nat. 58: 481-505. 1924.—Mice, of subsp. *Peromyscus maniculatus sonoriensis*, from the Mojave Desert were reared for more than 8 years at La Jolla, California, the resulting stock representing a minimum of 7 and a maximum of 12 or more generations. In respect to color or any single measured character, they did not undergo modification in the direction of the La Jolla subsp., *P. maniculatus gambeli*.—Another quite different subsp., *P. m. rubidus*, from the humid northwest coast of California, was reared for 6 years, representing a minimum of 4 and a maximum of 6 or 7 generations. Again there was no modification in the direction of the local race, *gambeli*. *Sonoriensis* and *rubidus*, reared for this long period under identical conditions of environment and food, did not converge in the least, in fact, the collections measured showed a slight divergence. *Peromyscus* of all races, native as well as introduced, show certain modifications due to captivity, irrespective of any climatic conditions. The subjection of *Peromyscus* of several subspecies to artificially modified atmosphere of high temperature and low humidity gave conflicting, though on the whole negative results after a 2-years' test. In juvenile pelage, mice of one subspecies appeared to have a distinctly paler pelage in a dry room, but this difference was reversed when the animals became adult. Other races showed no probable differences at any age.—These experiments are decisive for the view that differences between subspecies may be, at least in large degree, genetic. They also indicate a rather high measure of stability for these differences, under widely different environmental conditions.—*Author.*

5333. SUMNER, F. B., AND R. R. HUESTIS. **Studies of coat-color and foot pigmentation in**

subspecific hybrids of *Peromyscus eremicus*. Biol. Bull. [Woods Hole] 48: 37-55. 1925.—Pelages, both of the parent races and hybrids, were studied quantitatively with the tint-photometer and by means of microscopic counts and measurements of single hairs. The feet were graded according to an arbitrary scale. Twelve not entirely independent characters were dealt with. In general, there is a 'blending' type of inheritance, both in the F_1 and F_2 generations. With a single exception, variability is greater in F_2 than in F_1 ; likewise, with a single exception, there is a rough proportionality between amount of difference between parent races and amount of increase in variability. In general, coefficients of correlation between F_1 parents and their F_2 offspring are lower than those between pure-race parents and their F_1 offspring, while fraternal correlation seems to be lower in the F_2 generation than in F_1 . Pairs of characters which are correlated in parent races and in hybrids between these show, in general, higher correlation in F_2 than in F_1 . Certain elements which contribute to general pelage color are correlated with one another, and thus may be supposed either to have, in part, a common genetic basis or to depend upon linked factors.—These and earlier published data seem more in harmony with 'multiple factor' interpretation of results than the senior author had been led to believe by his previous studies of *Peromyscus*. At present the evidence is not decisive, however, for this or any alternative view. In any case, analysis of pelage color into somewhat more elementary characters has revealed no unit factor differences.—Authors.

5334. TAKAKUSU, S. Beobachtungen über die Spermiogenese in vitro. [Observations on spermatogenesis in vitro.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 22-28. 14 fig. 1924.—Follicles from the testes of Lepidoptera were grown in tissue culture, using the haemolymph of the dissected animals as the culture medium. Stages in spermatogenesis up to and including the 1st maturation division were examined, and the behavior was found in general to be normal. Certain features in the development of these cells can be determined better by examination of living cells *in vitro* than in fixed material.—Ralph E. Cleland.

5335. TANAKA, YOSHIMARO. Maternal inheritance in Bombyx Mori. Genetics 9: 479-486. 1924.—Certain cases of inheritance in the silk-worm moth described by Toyama are discussed and the characteristic of this form of inheritance are summed up as follows: "(1) F_1 individuals are like the female parent, regardless of the dominance or recessiveness of her character. (2) Dominant characters appear only in F_2 . (3) Segregation occurs apparently for the first time in F_3 between different batches, but never in the same batch. (4) Both dominant and recessive batches may, when inbred, give rise to both characters in the next generation." The occurrence of mixed broods as reported by Uda is accounted for by the supposition of 2 factors for brown eggs, one of which is maternally, the other ordinarily inherited. Two strains of brown of different origin have been discovered, one of which behaves as recessive to normal, the other showing maternal inheritance, as required by the assumption stated above.—H. H. Plough.

5336. TAUSON, A. Die Reifungsprozesse der parthenogenetischen Eier von Asplanchna intermedia Huds. [The process of maturation in parthenogenetic eggs of Asplanchna intermedia Huds.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 57-84. 4 pl. 1924.—In the case of female-producing parthenogenetic eggs, there are 2 maturation divisions, and 2 polar bodies are formed. In the prophase of the 1st division, stages resembling synapsis and the bouquet stage are observed, but are not followed by a diplotene stage. The spireme segments into 24 dumb-bell shaped chromosomes, which are divided transversely at anaphase. The spindle is intranuclear, and a centrosome is present at the inner pole of the spindle but not at the outer pole. No reduction occurs at this time. In the prophase of the 2nd maturation division, a spireme is again organized, and a synapsis stage once more appears, but there is, again, no thickening or doubling of the spireme. The spireme segments transversely, as in the 1st division, this time, however, into 12 dumb-bell shaped chromosomes, each of which is divided transversely at the following anaphase. The 2nd division is therefore reductional. In both cases, the division of the chromosomes is transverse, and there is no longitudinal splitting in either mitosis. During the following resting stage, the number of chromosomes somehow doubled, so that in the 1st cleavage division the number of chromosomes passing to each pole is 24. The males developing from these eggs, therefore, have the normal, and not

the reduced number of chromosomes, in spite of their parthenogenetic origin. The ♀-producing parthenogenetic eggs are larger than the ♂-producing ones. Only 1 polar body is cut off in these eggs. The number of chromosomes is 24, each of which is dumb-bell shaped, the division at anaphase being transverse. There is no reduction division. The mitosis for the 1st cleavage follows this single maturation division. The winter eggs, which are fertilized, are larger than the parthenogenetic ones, and have a thick chitinous covering. Two polar bodies are cut off. The sperm enters the egg during the resting stage following the 2nd maturation division, and fusion of the ♂ and ♀ nuclei then takes place.—*Ralph E. Cleland.*

5337. TERA0, HIROSI. **Plant breeding experiments with the opium poppy.** (Japanese). Rep. Imp. Hygienic Laboratory 19: 289-327. 1923.—For the purpose of plant breeding, a number of lines were isolated from certain populations of the opium poppy, *Papaver somniferum*, L. Most of these lines proved to be practically pure; this seems to be the consequence of the fact that, in this plant, the occurrence of cross-fertilization is actually rather rare on account of protandry. Among the isolated lines, several types were distinguished which exhibited respectively very distinctive characteristics in regard to the size and form of capsules, the maturing season, and some other characters relating to the production of opium. Hence it is concluded that the usual method of pure line selection may be quite effectively applied to ordinary populations of opium poppy. Crossings were also made among those distinctly different types mentioned above and the resultant F₁ hybrids were tested for practical purposes. The heterosis in these hybrids was generally quite significant, so far as concerned the development of capsules, the growth and maturation of the plant, and some other useful characters.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5338. TERA0, HIROSI. **The inheritance of self-sterility.** (Japanese.) Idengaku Zasshi [Japan. Jour. Genetics] 2: 144-155. 1923.—An account is given of a preliminary investigation on the inheritance of self sterility in *Petunia violacea*. When flowers of the self-fertile plant are bagged or closed and not hand-pollinated, they very often remain fruitless so that the plant may be mistaken for a self-sterile plant, or else they bear usually much less fruit than when hand pollinated. This disadvantage for self-fertilization seems to be due mainly to the flower structure in which the pistil is longer than the stamens to the extent that the stigma stands above the level of the anthers. Further, the different possibilities of automatic self-pollination are apparently caused by the condition that the relative length of pistil and stamens exhibits some variations among different plants, the stigma and anthers being set quite close in some plants and markedly apart in others. Hence, the selfing experiment for detecting the self-fertile and the self-sterile plants requires hand pollination. A self-fertile plant (with white flowers) was crossed with a self-fertile plant (with a different type of white flowers); the former was taken from a family which had been pedigreed through some generations, though it still segregated in regard to flowers colors and some other characters; the latter was of an unknown origin. In the selfing experiment with 48 F₁ plants in which the pollination was assisted by hand, 26 plants proved self-fertile (flower color: 14 white + 6 very light magenta + 6 light magenta) and 22 plants self-sterile (fl. col.: 10 w. 6 v. 1. m. + 5 l. m. + 2 dark m.).—As some authors have presented evidence for the fact that self-sterility is inheritable as a simple Mendelian recessive to self-fertility, it may well be presumed from the figures above noted that the crossing under consideration would correspond to the mating $Ff \times ff$ which should give rise to the F₁ progeny segregating in 1 Ff : 1 ff (F = the factor for self-fertility, f = the recessive allelomorph for self-sterility). Inter-crossing among the F₁ plants, which was tested with 14 self-fertiles and 11 self-steriles gave the following results: The matings, self-fertile $\times$ self-fertile, self-sterile (♀) $\times$ self-sterile (♂), and self-sterile (♀) $\times$ self-fertile (♂) were almost completely or very highly fertile; among self-steriles there occurred evidently 2 groups of plants, group A with 5 plants and group B with 2 plants, which, in inter-crossing, behaved in the same way that the plants belonging to one and the same group give incompatible matings among themselves, while any 2 plants belonging to different groups respectively present a compatible mating—the “intra-class sterile” and “inter-class fertile” groups as named by East. These data as a whole seem to suggest that one is probably dealing here with materially the same mode of inheritance as shown in East's study in *Nicotiana*, to which we owe perhaps the most advanced analysis in the genetics of self-

sterility.—Furthermore, it may deserve attention that there exist among self-fertile plants marked variations in regard to the intensity of self-fertility, and again that on the average the fertility in selfing of self-fertile plants is considerably lower than that of successful inter-crossings. The figures obtained in these connections are summarized in the following table:

	TOTAL NUMBER OF FLOWERS POLLINATED	SUCCESS- FUL POLLI- NATION	AVERAGE FERTILITY per cent
Selfing:			
Self-sterile.....22 plants	274	1	0.4
Self-fertile.			
Group I (Fertility 11-18%)..... 4 plants	44	6	13.3
Group II (Fertility 22-38%).....14 plants	182	50	27.5
Group III (Fertility 42-71%)..... 6 plants	59	32	54.2
Group IV (Fertility 100%)..... 2 plants	16	16	100.0
Total.....26 plants	301	104	34.6
Inter-crossing:			
Self-fertile × Self-fertile.....21 matings	41	40	97.6
Self-fertile (♀) × Self-sterile (♂).....30 matings	91	86	94.5
Self-sterile (♀) × Self-fertile (♂).....25 matings	39	30	76.9
Self-sterile × self-sterile			
Group A (♀ or ♂) × Group B (♂ or ♀)..... 8 matings	20	13	65.0
Group A × Group A}.....	78	0	0.0
Group B × Group B}			

—Author. (Courtesy Japanese Jour. Bot.)

5339. THOMPSON, DAVID H. Evidence of structure in the gene. Amer. Nat. 59: 91-94. 1925.—Results obtained from a study of the highly mutable bar allelomorphs in *Drosophila* indicate that the gene consists of a main particle, or base, firmly fixed in the chromosome, and other particles or modifiers, usually attached in a side chain series. Mutation consists in the gain or loss of modifiers or chains of modifiers.—Iva A. Merchant.

5340. TJEBBES, K. Crosses with Siamese cats. Jour. Genetics 14: 355-366. 1 pl. 1924.—These experiments included 56 cats. The original material consisted of a pair of pure Siamese, 1 white Persian female, and 1 common striped tabby male. White × Siamese produced 4 white and, in F₂, 7 white, 2 chocolate-black, and 1 striped Siamese. Siamese × dark tabby produced 3 chocolate-black and, in F₂, 5 chocolate-black, 2 Siamese, 1 dark tabby, and 1 pale tabby. Back crosses are also reported. Long hair of White is recessive. White also contains *D* for suppression of color; *A*, dominant over Siamese dilution; tabby factor presumably being dominant over ordinary coal black. Siamese have, in addition to *d* and *a*₁, *B* for chocolate-black, which is epistatic to tabby and in the presence of *A* gives uniform chocolate-black. The factor, *a*₁, restricts chocolate-black to tips. The occurrence of light tabby shows the presence of *c*, maltese dilution, but the failure of blues to appear indicates that *c* may possibly not effect dilution in the presence of *B*. Chocolate-black and striped Siamese are new types. Photographs of the latter are shown. Considerable study of eye pigments is reported. Pigmentation of iris stroma is always accompanied by presence of *tapetum lucidum* in choroid. Heterophthalmia in white cats is explained as an irregularity in dominance of *D* and similar to variations in distribution of dark neck spots.—P. W. Whiting.

5341. TUKADA, HIDEO, KIYOSUMI OKADA, AND HIROSI TERAQ. Mutation and plant breeding in regard to the giant tobacco. (Japanese.) Idengaku-Zasshi [Japan. Jour. Genetics] 2: 77-93. 1923.—The giant mutant occurring in an indigenous variety of tobacco was tested for the purpose of plant breeding. The mutant type yields twice or thrice as many leaves as ordinary varieties do, but it takes an exceedingly long vegetative growth so that plants of this type very seldom attain the flowering stage in the field. In the crossing between the mutant

and an ordinary variety, the giant type behaved as a simple Mendelian recessive to the normal type; the segregation ratio between these 2 types tends to show considerable deficiencies of the recessive and this is attributed very likely to the fact that the seedling of giant tobacco is apt to be eliminated in the seed bed on account of its slower growth. The giant plant, bearing seed only occasionally, has been raised yearly through the heterozygote from the crossing mentioned above, and the normal and the giant plants obtained from it were compared with each other in regard to their productivity as to the result of this experiment, the normal gave 1530 pounds of dry leaves per acre, valued at 843 yen; the giant, 2267 pounds, valued at 1132 yen. The quality of normal versus giant was in the ratio, 100:91.—The spontaneous occurrence of giant tobacco is observed occasionally in the indigenous varieties as it has been the case often in the tobaccos of the U. S. A., Java, and Sumatra; and corresponding to such giant varieties as Maryland Mammoth, Stewart Cuban, and the like, there is among the leading varieties of Japanese tobaccos a variety, named "Ensyōha," which exhibits every characteristic of the giant type. It is believed to have originated from a single plant selected by a careful grower many years ago, the cultivation of the named variety being limited to the warmer regions of the country. Generally, however, the gigantism seems not to be of much service in tobacco breeding so long as it is associated with the late maturing habit.—*Authors.* (*Courtesy Japanese Jour. Bot.*)

5342. TURNER, C. L. **Breeding habits and mutations in the moth-like fly (*Psychoda*).** *Science* 60: 338-339. 1924.—*Psychoda alternata* breeds readily in the laboratory in dung from horses or cattle. The life cycle is 12 to 16 days. *P. minuta* is bred successfully but with somewhat more difficulty under same conditions. Several mutations have appeared which reoccur regularly. Changes of temperature and moisture have induced a number of fluctuating variations. Reddish brown pigment in eyes, Malpighian tubules, and ocelli of larvae in the wild type have been found lacking in a simple recessive mutation breeding true for 48 generations. Two other mutations are being studied. Ease of manipulation, briefness of life cycle, and occurrence of mutations indicate this to be good genetic material.—*Anna R. Whiting.*

5343. VRIES, HUGO DE. **Über Scheinbastarde. [Pseudohybrids.]** *Naturwissenschaften* 12: 162-165. 1924.—The fact that a plant splits in its progeny does not necessarily prove that it is a hybrid. Splitting types can be derived from genetically uniform species without crossing. Such types the author calls false or "pseudohybrids." These may be divided into 2 groups, those which are visibly dimorphic, and those whose dimorphism is internal and invisible. The following kinds of visible dimorphism are discussed: (1) The splitting on the part of certain selfed races into 25% yellow seedlings which die early, 25% green plants with uniformly green progeny, and 50% green plants that split; (2) polygamy; (3) dioecism; (4) heterostyly.—Another common type of dimorphism is self-sterility. These are shown to be the result, not of crossing, but of the presence of 2 kinds of sex cells, to one of which is coupled a lethal factor. Internal dimorphism is found in the evening primroses. In this group, all members of a species are genetically identical. There is no visible dimorphism. Nevertheless, there are 2 types of gametes, and because of the presence of lethal factors, successful progeny are formed only in cases where the 2 types have fused. Two kinds of internal dimorphism are discussed: (1) *Oenothera biennis* and *O. muricata* are cited as examples of one type. These species are constant when selfed, but are characterized by unlike reciprocals when crossed, thus indicating that their sperms and eggs are different. It is assumed that there are lethal factors in these plants which act upon the sex cells, killing one type of gamete in the pollen, and the other type in the egg. All zygotes, therefore, result from a fusion of the 2 types of gamete, and hence the species are uniformly maintained; but since the sperms and eggs differ, reciprocal crosses of these plants will be unlike. It is necessary to assume further that the hereditary factors are inseparably linked together into 2 groups, each containing 1 of the 2 lethals, and acting as a single unit in heredity. Were this not the case, changes would no doubt have occurred, and there would be many subspecies in existence by this time. But *muricata* never mutates, so far as is known, and *biennis* throws only mutants that are characterized by deficiencies such as, for instance, the dwarf and *sulfurea* forms.—(2) *O. lamarckiana* represents the other type of internal dimorphism. Two types of gametes are present, neither

of which is killed prior to fertilization. In each type, all of the factors are united to each other, and to a lethal. The latter kills the young seed whenever like complexes meet in the zygote. The constancy of the species is therefore maintained, but approximately $\frac{1}{2}$ of the seed are dead. The evening primroses behave like hybrids in that they split according to the rule for monohybrids; but they are not true hybrids, since the 2 types that would be necessary to produce them cannot exist because of the presence of lethal factors. They are pseudohybrids, therefore, and must have come from earlier pure species in the same way in which dioecious, heterostylous and the many self-sterile forms have arisen. Internal dimorphism is not the cause of mutations, although it may facilitate their appearance; nor is there any relation between crossing and the presence of mutability.—*Ralph E. Cleland.*

5344. VRIES, HUGO DE, AND K. BOEDYN. **Doubled chromosomes of *Oenothera lamarckiana* semigigas.** Bot. Gaz. 78: 249-289. 2 fig. 1924.—In the cross, *Oenothera (lata* $\times$ *lamarckiana)* *semigigas* $\times$ *O. velutina*, the mutants belong to 7 main types corresponding to the older mutant races derived from *O. lamarckiana*. Six of them are those of the dimorphic mutants *lata*, *scintillans*, *cana*, *pallescens*, *liquida*, and *spathulata*, while 1 is new and designated as *O. lamarckiana* mut. *pulla*. Single plants of secondary types were observed, 1 *oblonga*, 2 *auricula*, 1 *candicans*, and 2 *hamata*, but the 7 main types, with the exception of *lata* and *cana*, occurred with about the same frequency. In about $\frac{1}{2}$ of the 81 mutants the chromosome number is 15, as in the older heterogamic mutant races. In the other $\frac{1}{2}$ the chromosome number is 16-20 and the external features are correspondingly mixed. The frequent types are 7 in number and a different chromosome is doubled in each of them. Of the rarer types, each also has 1 chromosome doubled but other factors of the same one have been activated. The new form, *O. pulla*, which is most nearly like the original *O. lamarckiana*, is assumed to have its factors located in the central chromosome. The remaining 6 types are the old dimorphic races, each designating a lateral chromosome, as previously described. [See also Bot. Absts. 13, Entry 1606.]—*Wanda Weniger.*

5345. WADA, UTAKITI. **Experiments on the breeding and heredity of sweet-potato.** (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 2: 137-144. 1923.—Sweet potatoes produce flowers very rarely in Japan proper, while in the Loochoo Islands where the author has made his experiments they very commonly bear flowers every year during November and December. Fruit are however very sparingly produced, though there is some variation according to different races. The author has performed artificial self-fertilization in 50 races in all, and found that among them $\frac{2}{3}$ do not bear fruit at all (self-sterile), while of those remaining some have produced 1-5 fruit per 100 flowers when artificially fertilized, in some others 20-30; in still others almost 50% may be produced. The following cross-fertilizations were made: (1) Cross between 2 self-sterile races or between a self-sterile on the 1 side and an almost self-sterile race on the other. No fruits are produced.—(2) Cross between a self-sterile and a self-fertile race in both reciprocal ways. Fruits are formed, and the higher the fructification rate of the fertile race by selfing, the larger that by the cross.—(3) Cross between 2 self-fertile races. If the fructification rate by selfing is larger in the one than in the other, that by the cross will be considerably heightened. On the contrary, the author has found in some cases that the cross of 2 self-fertile races ends in entire sterility or in a very low fertility.—The stem color is either green or red, the skin color of the tuber is either white or red, while its flesh color is either white or yellow. According to the author's experiments, which are not yet complete, it may be said that green stem, white skin and white flesh are dominant to red stem, red skin and yellow flesh, respectively; and that the segregation takes place according to the scheme of either 3:1 or 15:1.—*Author.* (Courtesy Japanese Jour. Bot.)

5346. WALTON, A. C. **Studies on nematode gametogenesis.** Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 167-239. 4 pl., 2 fig. 1924.—This study was directed particularly to the subject of compound chromosomes, and to the relation of cytological phenomena to the taxonomy of nematodes; 16 species of parasites were examined, belonging to 12 genera in 8 families. The chromosomes which are organized in the prophase of reduction divisions are called haploid chromosomes; those found in earlier divisions of the germ cells are referred to as diploid chromosomes. In what are considered to be phylogenetically the most primitive forms, the diploid chromosomes are monads and are the equivalents of the

somatic chromosomes. In more advanced forms, the germ cell chromosomes are each equivalent to 1 somatic chromosome plus a certain amount of chromatin which is later lost in the process of diminution. In these forms, the number of chromosomes in somatic cells and in the primordial germ cells of a given individual, is the same. Next we come to species in which each diploid chromosome is the equivalent of 2 somatic chromosomes and is called a "dyad;" and each haploid chromosome, being a tetrad of dyads, is called a di-tetrad. The somatic number of chromosomes is tetraploid. The culmination of the series is seen in such forms as the varieties of *Ascaris megalocephala*, in which each germ-cell chromosome is the equivalent of many somatic chromosomes (22 and 26). Heterochromosomes are compound, as well as autosomes, being the equivalent of 8 somatic chromosomes. Tetraploid or higher somatic chromosome numbers are not the result of fragmentation, but represent the phylogenetically primitive number for the species. The germ-cell chromosomes are compounds of a definite number of these simple chromosomes. All species studied showed a heterochromosome complex of the X type, usually 1 in number but numbering as high as 5 or 6 in some species. Diminution of chromatin material is found in all of the Ascarinae, but is apparently absent in the others.—*Ralph E. Cleland.*

5347. WEISS, FREDERICK E. **A tri-hybrid Primula.** Mem. and Proc. Manchester Literary and Phil. Soc. 68: 91-96. *Illus.* 1924.—The author reports on 6 trihybrid individuals resulting from crossing F_1 *Primula acaulis* $\times$ *P. elatior* with *P. Juliae* Kusnetzou. In comparing the trihybrid with the *P. acaulis* $\times$ *P. elatior* hybrid the following points are of interest: (1) Dominance of hairiness in the latter and glabrousness in the former; (2) dominance of scape in the latter and recessiveness in the trihybrid; and (3) variation of color among the 6 trihybrids, giving for example, 3 yellow, 2 mauve, and 1 yellow streaked with purple. The author suggests varying dominance when *P. Juliae* is separately crossed with the other 2 species, as shown by the data of Chittenden.—*J. Ben Hill.*

5348. WINGE, Ö. **Zur Frage der Lethalfactoren.** [The question of lethal factors.] Zeitschr. Indukt. Abstamm.- u. Vererb. 35: 279-285. 1924.—Haecker's (1923) hypothesis to explain Winge's breeding results with dichæte *Drosophila* is discussed and evidence is presented to show that the author's explanation is the simpler and more adequate. Winge assumes that the mutant, dichæte, is a compulsory heterozygote *DVdv* (*D* = dichæte; *V* = a vitality factor). By crossing-over, occasional normals arise, which are *dVdv* instead of the usual *dvdv*; these when crossed with dichæte give a new dichæte, *DVdV*. Crossing new dichæte with the old normal gives 1 dichæte: 1 normal, while old dichæte by new normal gives 2 dichæte: 1 normal.—*M. M. Lesley.*

5349. WITSCHI, EMIL. **Die Entwicklung der Keimzellen der Rana temporaria L. Erster Teil: Urkeimzellen und Spermatogenese.** [Development of the germ cells of *Rana temporaria* L. Part 1. The germ-track and spermatogenesis.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 523-561. 3 pl., 29 fig. 1924.—The development of the germinal tissue was traced from the time of its 1st appearance in the larva up to the adult condition. The yearly cycle in the development of the reproductive cells in adult males was also studied in the case of local races in different geographical locations. It was found that the transfer of animals to regions possessing different climatic conditions failed to cause a modification in the normal cycle. Spermatogonial figures show 26 chromosomes of varying size and shape; 10 are relatively large, and 16 relatively small. Leptotene and pachytene stages are described with synapsis occurring during the bouquet stage. In strepsinema, an end to end union of bivalent chromosomes is often seen, resulting in 5 compound chromosomes. These, however, separate in diakinesis, and 13 pairs are generally observed during this stage. In metaphase, the 4th largest chromosome pair separates, and the members pass to the poles before the other chromosomes, showing these to be the sex elements. The chromosomes in metaphase can be identified with those in spermatogonial divisions, inasmuch as they retain the same relative size and shape. In the 2nd maturation division, the sex chromosomes lag behind the others in the spindle. The parts which are separated in the case of these chromosomes are unequal in size and are considered to represent the X and Y elements, which therefore are separated in the 2d division rather than in the 1st. Apparently, however, the 1st division is reductional as regards the autosomes. The Y chromosome is thought to be a reduced X chromosome with

respect not only to the somatic, but also to the sex chromatin. The factor for sex contained in the X chromosome is present in the Y chromosome in a mutated and weakened form, so that sex inheritance occurs through this chromosome as well as through the X element. This condition is not frequent, being found only in sexually differentiated forms which still retain a trace of hermaphroditism. The Y chromosome is a relic of an X chromosome that was fully functional in the original hermaphrodite condition, but which has more and more lost its function as the sexes have become separate, until in many forms it has disappeared.—*Ralph E. Cleland.*

HORTICULTURE

F. C. BRADFORD, *Editor*

(See also in this issue Entries 5004, 5007, 5043, 5086, 5112, 5259, 5260, 5281, 5285, 5297, 5308, 5610, 5652, 5653, 5657, 5660, 5663, 5664, 5679, 5684, 5687, 5689, 5690, 5703, 5736, 5744, 5815, 5819, 5820, 5831, 5944, 6003)

5350. ANONYMOUS. An African representative of the Iris family. Missouri Bot. Gard. Bull. 11: 42. Pl. 8-9. 1923.—*Moraea iridioides* grows and flowers in the Garden but is not hardy outside the tropical fruit house.—O. T. Wilson.

5351. ANONYMOUS. An expedition for orchids to Central and South America. Missouri Bot. Gard. Bull. 11: 79-90, 97-107. Pl. 18-23, 25-27. 1923.—Notes are given upon the expedition of G. H. Pring, horticulturist of the Garden.—O. T. Wilson.

5352. ANONYMOUS. Autumn-flowering elms. Missouri Bot. Gard. Bull. 11: 127. Pl. 31. 1923.—*Ulmus parvifolia*, *U. serotina*, and *U. crassifolia* are briefly described.—O. T. Wilson.

5353. ANONYMOUS. Dahlias from seed. Missouri Bot. Gard. Bull. 11: 39-40. Pl. 6. 1923.—Cultural directions are offered by which flowers may be secured from seed in 1 season, in the St. Louis district.—O. T. Wilson.

5354. ANONYMOUS. Materials for miniature gardens. Missouri Bot. Gard. Bull. 11: 75. Pl. 17. 1923.

5355. ANONYMOUS. Muskmelons. Missouri Bot. Gard. Bull. 11: 18-22. Pl. 4. 1923.—Descriptions are given of the following varietal groups of *Cucumis melo*: (1) canteloupes, (2) netted melons, (3) sugar melons, (4) winter melons, (5) serpent melons, (6) cucumber-formed melons, (7) Chito melons, (8) Dudaim melons, (9) red Persia melons and (10) wild melons. The grouping is that of Naudin.—O. T. Wilson.

5356. ANONYMOUS. The Botanical Gardens of Jamaica. Missouri Bot. Gard. Bull. 11: 131-137. Pl. 32-34. 1923.—An account is given of a visit by G. H. Pring.—O. T. Wilson.

5357. ANONYMOUS. The feature garden. Missouri Bot. Gard. Bull. 11: 70. Pl. 16. 1923.

5358. ANONYMOUS. The hardy fruit crop. Gard. Chron. III. 74: 65, 71-76. 1923.—Hardy fruit crops in all parts of Great Britain and the Channel Islands in 1923, were among the worst on record. The numerous causes were discussed in detail.—P. L. Ricker.

5359. ANONYMOUS. The Scotch or Wych elm. Missouri Bot. Gard. Bull. 11: 41. Pl. 7. 1923.

5360. ANONYMOUS. Yellow-wood. Missouri Bot. Gard. Bull. 11: 17. Pl. 2-3. 1923.

5361. AUSTIN, LLOYD. Pruning bearing almonds and apricots. California Cultivator 64: 27, 30. 3 fig. 1925.—This paper discusses the fruiting habits of the trees, the ordinary methods of pruning followed by successful growers and data from experimental pruning studies on apricots at the Davis branch of the California Exp. Sta. Larger crops have resulted from light thinning of the branches than from heavier pruning. Special precautions are given for the pruning of trees attacked by brown rot or bacterial gummosis.—C. S. Pomeroy.

5362. AUTON, W. Ornamental gourds. Gard. Chron. III. 73: 198. 1923.—Notes are presented on some of the varieties and their cultivation.—P. L. Ricker.

5363. BAKER, C. E. How to handle apples in cool storage. Amer. Fruit Grower 44¹¹: 4, 14. Illus. 1924.—This is a discussion of the handling of apples in cool storage with special

consideration for the quality of fruit to store and the factors, together with their relation to one another, which enter into the subject of successful operation of a cool storage.—*Arthur S. Rhoads.*

5364. BEAN, W. J. *Rhodendrons*. [Rev. of: MILLAIS, J. G. *Rhodendrons and the various hybrids*. 2d ser. xii + 265 p. Longmans Green & Co.: London, 1924 (see Bot. Abst. 14, Entry 3440).] *Nature* 114: 636-637. 1924.

5365. BLATT, R. J. *Viticulture in South Africa*. *California Cultivator* 63: 421, 436-437. 1924.—This is an account of the grape industry in South Africa where over 102,000,000 vines are grown. The exports in 1923 were 225,214 boxes, which was about $\frac{1}{4}$ the total deciduous fruit export.—*C. S. Pomeroy.*

5366. BROTT, HOMER. *Orange growing in Bahia*. *Citrus Indust.* 5¹²: 9. 1924.—A brief discussion is given of orange growing in Bahia, Brazil, including the history, varieties, soils, fertilization, planting, general grove practices, and production.—*Arthur S. Rhoads.*

5367. CHRISTIE, ARTHUR W. *Refined vs. crude sulphur in fruit drying*. *California Cultivator* 63: 77. 1924.—Experimental work at the University of California shows that with proper precautions and equipment, just as satisfactory dried fruit can be produced with crude sulphur as with sublimed sulphur, but its use is not recommended to growers who need only a few sacks per season unless they fully understand how to handle it.—*C. S. Pomeroy.*

5368. CHRISTIE, ARTHUR W. *Walnut dehydration*. *California Cultivator* 62: 595, 599. 1924.—This is a presentation of results of studies which are to be published as an Exp. Sta. bulletin. The advantages of dehydration over sun-drying are enumerated as (1) weather insurance, (2) theft insurance, (3) drying efficiency, (4) labor efficiency, (5) packing house efficiency and (6) marketing efficiency—a gain in time. It was found that the maximum safe temperature was 110°F., though the slightly immature nuts gathered early in the season should not be dried above 105°F. Lower temperature simply increases the time required. In 1 test, 42 hours was required at 90°F. The cost of dehydrating walnuts is no greater than the average for sun-drying, as the material saving in labor counterbalances the fuel and power cost.—*C. S. Pomeroy.*

5369. COLE, LEON J. *A seedless muskmelon*. *Jour. Heredity* 15: 219. 1 illus. 1924.—A seedless muskmelon was discovered in Wisconsin; its previous history is unknown. The thick fleshy part was of a rich orange color, and when freshly cut the central portion, containing the abortive seed, had much the same appearance, being relatively solid and showing very little of the fibrous, stringy texture of the ordinary melon.—*H. Cook.*

5370. CRUESS, W. V. *Olive pruning in Southern Europe*. *Pacific Rural Press* 109: 33. 4 fig. 1925.—Descriptions are given of methods in use in the districts around Seville and Tarragona, Spain, in Southern France and in Italy. It is suggested that the methods described should be tried in California.—*C. S. Pomeroy.*

5371. DONN, JAMES. *Supplying the needs of the landscape architect in Florida*. *Florida Fruits and Flowers* 1⁶: 93-94. 1924.—The author comments on impracticable landscape plans too often designed by those who have had no experience in tropical or seashore planting, and on the complaint of some who come to Florida for the winter months that Florida has no flowers in winter. He itemizes a list of trees, shrubs and vines that are at the disposal of the landscape architect in Florida and considers that the state has an abundance of material for use. Annual flowering plants are discussed. The matter of making lawns, which is a problem that concerns the landscape architect greatly in Florida, is discussed and a number of suggestions are given as to the preparation of lawns and the best grass varieties for various purposes.—*Arthur S. Rhoads.*

5372. ELLIOTT, CLARENCE. *Dianthus atkinsoni*. *Gard. Chron.* III. 74: 70. 1923.—Inquiry is made as to the origin of *Dianthus atkinsoni*. A very old specimen was found about 1907 in Wood's Nursery at Yorkshire, with an almost woody stem as thick as ones thumb; 150 plants were propagated from this.—*P. L. Ricker.*

5373. GARTNER, F. A. *Citrus growing in Texas*. *Citrus Indust.* 5¹¹: 40-41. 1924.—This is a description of citrus growing at Falfurias, Brooks County, Texas, as contrasted with soil conditions and values of grove land in the Rio Grande Valley.—*Arthur S. Rhoads.*

5374. GODBEY, T. K. **Adapting the Gladiolus to Florida culture—and other bulb notes.** Florida Fruits and Flowers 14: 84. 1924.—Brief notes are given of bulb culture in Florida, which has made great progress within the past 12 months, since the federal quarantine soon threatens to shut off the supply from abroad. The plantings have been mainly of *Gladiolus* and *Narcissus*, both of which are considered to be well beyond the experimental stage. *Freesia*s and *Lilium Harrisii* also are receiving much attention and are a demonstrated success. The growing of hyacinth bulbs also is said to be perfectly feasible in Florida. *Canna* growing is receiving much attention and the plantings are increasing. *Lecojum vernum* seems to be perfectly at home in central Florida, and the flowers make a good substitute for Lily-of-the-valley. Spanish Iris has done fairly well but seems to deteriorate, while tulips are reported to have been a failure.—Arthur S. Rhoads.

5375. GROSDEMANGE, CH. **La merveilleuse Ceinture dorée de la Bretagne.** [The marvellous golden belt of Brittany.] Jardinage 11: 26-31. 1924.—The vegetables grown here are briefly described. Not many fruits are grown; but 1 remarkable fig is described and figured—the Fig of Roscoff. It dates back to 1621 and measures 3 m. in circumference. The smaller branches are supported on cement pillars. It covers not less than 6 acres.—L. Pace.

5376. GROVE, A. **Sterility in lilies.** Gard. Chron. III. 74: 308-309. Fig. 112. 1923.—Comments are made relative to an article on the subject by A. O. STONE in the Jour. Heredity.—P. L. Ricker.

5377. HALMA, F. E. **Effect of season on the regeneration of sour orange roots.** California Citrograph 6: 273, 299. Fig. 1-2. 1921.—Studies on roots pruned at intervals of a month to 6 weeks from March 19, 1919, to Feb. 13, 1920, showed that those cut from about the 1st of May to the last of October sent out new roots within 2 weeks, while those pruned between November and April remained inactive until the end of April—indicating that the active period of root growth is practically the same as that of the shoots. Some practical bearings of this study are mentioned.—C. S. Pomeroy.

5378. HAWKINS, PAUL D. **Grafting and vinifera experiments.** Florida Fruits and Flowers 14: 69, 76, 78. 1924.—The author describes the methods he used in Florida in making about 2,000 grape grafts, with 14 different stocks and 63 different cions, this number being about equally divided between cutting to cutting and cutting to rooted vine. The cions were all *Vitis vinifera*, and the rootstocks a selection which seemed promising for Florida soils and climate and in the majority of cases of more or less unknown affinity for the cions used, but they included some of the California stocks which were of known behavior with the cion. The author does not believe that the roots of native varieties will ever make a satisfactory commercial rootstock, though they promote vigorous growth and, in many instances, fair fruitfulness. Their habit of growth, both as to root and cane, however, is thought not to conform to the treatment necessary to produce fruitfulness in *Vitis vinifera*; these native vines do not propagate well from cuttings, or lend themselves readily to bench-grafting. The native vines are believed to furnish a possible basis for hybridization with the finer sorts to procure as nearly as possible an ideal rootstock for Florida uses, and as a foundation for many excellent fruiting sorts thoroughly suited to Florida conditions.—Arthur S. Rhoads.

5379. HEATH, FANNIE M. **The high-bush cranberry.** Amer. Bot. [Joliet, Illinois] 31: 3-5. 1925.

5380. HILL, ARTHUR W. **The keeping of pollen.** Rhododendron Soc. Notes 24: 159. 1923 [1924].—Experiments made by the author showed that pollen of *Rhododendron discolor* retained its power of germination if kept in an exsiccator from June till April, or for 291 days, while, if kept in ordinary air, pollen collected on June 26 germinated in July but failed to do so in October.—Alfred Rehder.

5381. HODGES, R. E. **The camel's thorn is coming.** Pacific Rural Press 109: 73. 1925.—An account is given of the start and rapid spread of this weed in the Coachella and Imperial valleys of California, which is believed to present a serious menace to all cultivated plants. Last year Riverside County spent about \$2,000 trying to eradicate it from 25 acres and did not even check it.—C. S. Pomeroy.

5382. HOLMES, E. M. **Loss of fragrance in the musk plant.** Gard. Chron. III. 75: 78-79. 1924.—The general disappearance of *Mimulus moschatus* was first referred to in this journal in 1909. The species was originally described by Douglas in 1825 and is said to be mostly without odor in British Columbia but it develops the odor when grown as a pot plant in a sunny situation. Evidence from laboratory examination of the plants is reported.—*P. L. Ricker.*

5383. JAMES, L. W. **Production and analysis of citrus fruits grown in Porto Rico.** Citrus Indust. 5¹²: 16, 18. 1924.—The orange and the grapefruit are said to be the only 2 citrus fruits at present cultivated commercially in Porto Rico; though inferior varieties of lemons and native limes are produced, they are used almost entirely for home consumption. Though no accurate figures are available for the production of any type of citrus fruit, the export statistics, which are given for grapefruit and oranges from 1918-1924, are said to provide fairly accurate measures of production, especially in the case of grapefruit. Practically all of the oranges and grapefruit exported from Porto Rico are shipped to the U. S. A. The possibilities of the utilization of the juices and oil of the surplus oranges in Porto Rico are discussed. This is considered economically possible and particularly desirable in the case of the abundant wild and semi-wild oranges, which, even when ripe, generally have a green, and in many cases, rather thick skin which detracts from their value in the markets of the continental U. S. A. Data are given concerning the chemical analyses of Duncan, Marsh Seedless and Triumph at different months and of oranges, naranjas and limes.—*Arthur S. Rhoads.*

5384. KIRKWOOD, W. J. **Florida's banana future.** Florida Fruits and Flowers 1⁶: 129. 1924; 2¹: 7-8, 13. 1925.—The author discusses the varieties of banana suited to commercial culture in Florida; these are limited to 2, namely the Lady Finger and Cavendish. Of these, the Cavendish is said to be less tropical and the more serviceable variety for the Florida grower.—*Arthur S. Rhoads.*

5385. KRELAGE, ERNEST H. **The development of the Dahlia.** Gard. Chron. III. 74: 204, 238, 250-251, 265. 1923.—Reference is made to a collection of trade catalogues at the State Agricultural University at Wageningen. The oldest published reference to the Dahlia is by Hernandez, 1805-1806. Show varieties were originated by William Wells previous to 1828.—*P. L. Ricker.*

5386. KRUG UND FIESSELMANN. **Die 1923-er Weinernte in der Pfalz.** [Vintage of 1923 in the Palatinate.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 271-275. 1924.—This paper records climatic and temperature conditions and analytical tabulations on wine and must.—*E. E. Stanford.*

5387. McCLELLAND, T. B. **Coffee varieties in Porto Rico.** Porto Rico Agric. Exp. Sta. Bull. 30. 1-27. 11 pl. 1924.—Coffee holds 2nd place in Porto Rico as an agricultural export, most of the crop being shipped to Europe. It is of the Arabian type and is comparatively low in caffeine content. No distinct varieties are recognized except that the upland crop sells at a better price than that produced nearer sea level. The Experiment Station has tested numerous varieties from other coffee growing countries, some of which are indistinguishable from the Porto Rican while others differ materially. The ripening season for the different varieties includes every month so that by their use the customary labor shortage may be avoided. Of the coffees tested, Columnaris, Maragogipe and San Ramón of the Arabian group mature later than the Porto Rican. Varieties of the Robustoid and Liberian groups are still later. The 3 groups are clearly divided as to cherry size, the Liberian group containing large cherries and the Robustoid small. Excelsa, with small cherries, and Maragogipe, with large, are exceptions. The groups are not clearly divided as to bean weight. The Liberian group is made up of larger beans than the Robustoid. There is a wide range in the Arabian group from Mocha with the smallest, to Maragogipe weighing 3 times as much and nearly equaling Liberica, the largest of all. Peaberry ratios are as follows: Arabian, 6-17%; Liberian, 14-29%; and Robustoid, 18-41%. Reductions made by buyers for parchment are: Liberian, 24-33%; Arabian, 15-20%; Porto Rican, 17%; and Robustoid, 12-14%. Of the Arabian group, Padang, Columnaris, Erecta and Bourbon varieties have proved vigorous and productive and of good cup quality. Maragogipe, because of low

yields, does not warrant commercial exploitation. Mocha, San Ramón and Murta give low yields per tree but acre-yields may be increased by closer planting than is customary. Under Porto Rican conditions, Robusta and related varieties have given low yields and proved inferior in cup quality.—*John A. Stevenson.*

5388. MACH, F., UND M. FISCHLER. Die Zusammensetzung der Moste des Jahres 1922 in Baden. [Composition of the must of 1922 in Baden.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 366-371. 1923.

5389. MACH, F., UND M. FISCHLER. Die Zusammensetzung der Moste des Jahres 1923 in Baden. [Composition of the must of 1923 in Baden.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 48: 176-179. 1924.

5390. MATTHEWS, C. D. Training and pruning young apple trees. Amer. Fruit Grower 44¹²: 5, 10. *Illus.* 1924.—This article presents the results of 6 years of investigations on the pruning and training of young apple trees in North Carolina, undertaken with the hope of securing definite information of value for eastern conditions. This work was confined to the Rome, Winesap, Delicious, and Stayman varieties.—*Arthur S. Rhoads.*

5391. MEAD, THEODORE L. Fancy-leaved Caladiums. Florida Fruits and Flowers 1⁵: 94, 112. 1924.—This is a general discussion of Caladium culture in Florida, including the wintering of the tubers, varieties of fancy Caladiums, and the stimulation of seed production.—*Arthur S. Rhoads.*

5392. MORLEY, JOHN. Notes on avocados in central Florida. Florida Fruits and Flowers 1²: 31, 38. 1924.—This is a discussion of avocado growing on the high sandy lands of central Florida. The author believes that the backwardness of many avocado trees in this section is the result of bad rootstocks. He is of the opinion that avocados should not be propagated promiscuously on seedlings, regardless of their origin. For the section of Florida under discussion, stocks from thrifty, bearing trees of Guatemalan or West Indian avocados are considered preferable to stocks from the Mexican sorts. The avocado is considered to be a "woody" tree and it is believed that it is necessary to approximate closely its soil and moisture requirements. The value in avocado culture of applications of water and decayed vegetable matter or manure to light sandy soils is pointed out. The problem of the non-setting of fruit on young trees is discussed.—*Arthur S. Rhoads.*

5393. MOTTET, SERAPHIM. Origin and evolution of summer flowering gladioli. Gard. Chron. III. 73: 164, 177-178. 1923.—This is a translation of: Notes sur l'origine et l'évolution des races de glaïeuls à floraison estivale. Jour. Soc. Nat. Hort. France 23: 363-368. 1922.

5394. NICHOLS, R. A. The Florida Marvel blackberry. Florida Fruits and Flowers 1¹: 12. *Illus.* 1924.—This is an account of the Florida Marvel blackberry with special reference to the origin, early history and value of this fruit as an additional means of diversifying Florida's horticultural activities. This blackberry, which is said to have been discovered in a jungle of wild blackberries and dewberries in a wooded area near New Smyrna, Florida, is considered to be superior in every way to the Logan blackberry.—*Arthur S. Rhoads.*

5395. NIWA, TEIZO. Chrysanthemums in Japan. Gard. Chron. III. 75: 177-178. *Fig.* 75. 1924.—Because of association with the Royal Family, the Chrysanthemums have been venerated for 900 years. These are grouped as Macroflorae, Mediflorae and Microflorae. Popular varieties in each group are mentioned. Some varieties are also edible and usually have yellow, fragrant petals, used in cooking. At some of the festivals, varieties are exhibited having a single stem 13 feet high, and flowers 10-19 inches in diameter. Others carry 1000 flowers, each 8 inches wide and the whole plant having a spread of 18 feet.—*P. L. Ricker.*

5396. PICKETT, B. S. Transplanting large apple trees. Amer. Fruit Grower 44¹²: 4, 9, 28. *Illus.* 1924.—After calling attention to the desirability of being able to move large trees economically and to the conditions for successful transplanting, the author describes 2 methods for transplanting such trees. The 1st is recommended for trees that have been growing in the orchard 3-6 years and which have a trunk 2½-4½ inches in diameter; the 2nd method is recommended for older trees with trunk diameters up to 12 inches.—*Arthur S. Rhoads.*

5397. PINN, A. J. A neglected industry. Agric. Gaz. New South Wales 35: 908. 1924.—

Increased attention to the growing of asparagus in New South Wales is recommended.—*L. R. Waldron.*

5398. PRIEGO, J. MANUEL. *Las variedades del olivo en la región agronómica central.* [Olive varieties in the central agricultural region.] Bol. Agric. Tec. y Econ. [Spain] 15: 159-176. 23 fig. 1923.—Olives are most abundantly grown in Spain in the region called "New Castile" including the provinces of Madrid, Toledo, Cuenca and Guadalajara. Various types have been developed which are adapted to the varying cultural and climatic conditions prevailing in the region. The more important of these varieties of *Olea europea* are *rostrata* Clem. (cornicabra), *spherica* Gouan. (Manzanillo), *collumela* Clem. (Carrasqueño), *oleaster* De Can. (Acebuche), *hispalensis* Clem. (Gordal or Gordero), *regalis* Clem. (Servilano) and *viridula* Clem. (Verdejo). These varieties are discussed as to their relative importance, areas of growth, botanical habit and cultural characteristics.—*John A. Stevenson.*

5399. PRIEGO, J. MANUEL. *Las variedades del olivo en la región agronómica de Andalucía oriental.* [Olive varieties in the region of Eastern Andalusia.] Bol. Agric. Tec. y Econ. [Spain] 16: 252-271. 23 fig. 1924.—There are 273,000 ha. of bearing olive trees in this region and 60,000 ha. of young trees. Production varies from 300 hectoliters to 450 where the orchards are irrigated. The different varieties grown are divided into the 2 groups: (1) Picuda and (2) Nevadillos. *Olea europea rostrata* is the most important variety of the 1st group; its botanical description and cultural characters are given. *O. europea cavanillesii* and *O. europea ceraticarpa* of the same group are also described.—In the 2nd group are a number of related varieties suited to xerophytic conditions. The following varieties of *O. europea* are illustrated and described: *argentata*, *alba*, *banqueri*, *lagascae*, *racemosa* and *alorensis*.—*John A. Stevenson.*

5400. PRIEGO, J. MANUEL. *Origen, desarrollo e importancia del cultivo del olivo.* [Origin, development and importance of olive culture.] Bol. Agric. Tec. y Econ. [Spain] 15: 370-382. 1924.—The origin of olive culture is hidden in antiquity. Ancient legends and the earliest literature refer to it. The tree is mentioned in Genesis and there are many references to it in Greek mythology. Culture of the olive, apparently indigenous to the eastern Mediterranean region, followed civilization westward, along both the north and south shores, meeting in Spain. The history of olive culture in Asia Minor, Greece, Turkey, Italy, France, Portugal, Spain, North Africa, Chile, Peru and California is reviewed.—*John A. Stevenson.*

5401. [PRING, G. H.] *The private orchid collection of Mr. C. W. Powell.* Missouri Bot. Gard. Bull. 11: 117-126. Pl. 29-30. 1923.—The collection in the garden of Mr. Powell in Balboa consists of over 5000 specimens representing 60 genera, including 175 species of known nomenclature.—*O. T. Wilson.*

5402. RHODODENDRON SOCIETY. [Notes.] Rhododendron Soc. Notes 24: 145-212. Map. 1923 [1924].—The number for the year 1923 contains 21 articles, mostly brief, contributed by members of the Society, which are chiefly notes on the behavior, flowering, hardiness, ornamental merits, cultivation, etc., of Rhododendrons in different places in Great Britain.—*Alfred Rehder.*

5403. SCHMITT, RICHARD. *Die 1923-er Traubenmoste Frankens.* [Must of 1923 in Franconia.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 275-276. 1924.

5404. SCHMITT, RICHARD. *Untersuchung von 1922-er Traubenmosten Frankens.* [Investigation of the must of 1922 in Franconia.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 371-372. 1923.

5405. SCHNEIDER, CAMILLO. *A garden of evergreen shrubs at Malonya, Czechoslovakia.* Gard. Chron. III. 74: 172-173. 1923.—Notes are given concerning the gardens of Count Istvan Ambrozy-Migazzi at Malonya, district of Nyitra.—*P. L. Ricker.*

5406. SHAMEL, A. D. *Some of the principal factors in lemon curing.* California Citrograph 6: 375, 400. 1 fig. 1921.—Lemon curing is a controlled ripening process rendering the fruit better adapted to the consumers' use, and in commercial practice consideration is given the age of the fruit, the season during which it is picked and the market demand of the near future. The most noticeable effects during proper curing include change of color of the rind to a light yellow or straw color; the rind becomes thinner and smoother, the cut stems tend to callous over, there is a slight loss of weight, the juice is apparently more easily

expressed after curing, and the shipping and keeping quality of the fruit seems to be improved through the toughening of the rinds. Conditions affecting curing are temperature, humidity and certain undetermined gases which are usually secured by burning oil stoves or by use of the exhaust from gas engines. Changes in temperature seem to influence the time of the curing process and variations in humidity affect the color and texture of the rinds and the condition of the buttons. Uniformity of these conditions during curing produces best results. The recording of temperature and humidity conditions 3 times daily during curing is desirable.—*C. S. Pomeroy.*

5407. SHAW, J. K. **Leaf characters of apple varieties.** Massachusetts Agric. Exp. Sta. Bull. 208. 21-31. 1922.—A leaf-key is presented by which the principal commercial apple varieties of Massachusetts may be distinguished. This is followed by a detailed description of the leaf characters of each variety and photographs of many of them.—*P. J. Anderson.*

5408. SHOEMAKER, J. S. **Development of fruit growing in Canada.** Amer. Fruit Grower 44¹¹: 8, 14. *Illus.* 1924.—The development of fruit growing in Canada is discussed with regard to fruit districts, sources of fruit, growers' organizations, and varieties originated in Canada. Statistics are also given in regard to the present status of fruit production and the commercial fruit products of Canada.—*Arthur S. Rhoads.*

5409. STERN, J. **Moste des Jahres 1923 aus den Weinbaugebieten der Nahe, des Glans, des Rheintals linksrheinisch unterhalb des Rheingaus.** [Musts of 1923 of the vineyards of Nahe, Glans, and the left bank of the Rhine Valley below Rheingau.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 48: 179-181. 1924.

5410. STEWART, L. B. **The propagation of difficult plants.** Gard. Chron. III. 73: 318, 333, 361. 1923.—Directions are given for propagating numerous plants which do not respond readily to the usual methods.—*P. L. Ricker.*

5411. THATCHER, A. E. **Chinese trees at Aldenham.** Gard. Chron. III. 72: 119, 138, 166, 226. *Fig. 47, 56.* 1922.—A brief general and habit description of Chinese trees, chiefly ornamentals, is given.—*P. L. Ricker.*

5412. TRUFFAUT, GEORGES. **Le Jardin de Claude Monet.** [Claude Monet's garden.] Jardinage 11: 55-59. 1924.—With its water plants, its extensive collection of hybrid gladioli, its different species of bamboo and its charming arrangement of Clematis among many other garden delights, it is "The most beautiful thing" the painter, Claude Monet, ever made.—*L. Pace.*

5413. TRUFFAUT, GEORGES. **Rosiers pour les Jardins modestes.** [Roses for the small garden.] Jardinage 11: 15-17. 1924.—A list of about 40 roses is given, with a brief description of each.—*L. Pace.*

5414. WALLSCHLAEGER, F. O. **Changes in cost of production of citrus fruits since 1910.** California Citrograph 6: 341, 356, 367. 1921.—Itemized summaries are presented showing the average costs on a representative number of orange and lemon properties in 1910, 1918 and 1920 as secured by the California Citrus League. In 1920 data were obtained from 350 orange growers having 9133 acres and 230 lemon growers with 5507 acres, the number of accounts of both fruits from each principal district being approximately in proportion to the shipments from that district. The average cost of production in 1920 is shown as \$241.56 per acre on the orange groves under investigation and \$295.52 per acre on the lemons, or \$1.602 per box for oranges and \$1.671 per box for lemons. The handling and marketing costs are presented and the total delivered costs to eastern markets are given as \$4.178 per box of oranges and \$4.780 per box of lemons.—*C. S. Pomeroy.*

5415. WATERS, R. **Loss in weight of stored apples.** Outline of flesh collapse experiments in Nelson District, season 1924. New Zealand Jour. Agric. 29: 315-325. 1 *fig.* 1924.—Preliminary studies have indicated that loss in weight of stored fruit may serve as an index of the cool storage factors such as circulation, temperature, humidity and loading. Further experiments were conducted in commercial cold storage, with 7000 cases of apples. An attempt was made to produce approximately 3.7% loss in weight during the first 6 weeks of storage. The apple flesh temperature was maintained at 33-40°F. and the relative humidity as near 60% as possible. Very satisfactory control of flesh collapse is being secured, although there has been difficulty in controlling storage conditions. The work is being continued.—*N. J. Giddings.*

5416. WHITTINGHAM, R. R. *Satsuma fertilization and cultivation*. Citrus Indust. 61: 24-25. 1925.—This is a discussion of the effect of fertilization and cultivation of Satsuma oranges in Bay County, Florida, on their ability to withstand low winter temperatures. The relation of methods of fertilization and cultivation in Satsuma groves are compared for seasons 1922-1923 and 1923-1924. In both winters the trees in which the foliage had become yellowed through neglect or too early cessation of fertilization and cultivation, are said to have been damaged by cold considerably more than trees in which these practices were continued longer so that a green but still dormant foliage condition was maintained.—*Arthur S. Rhoads*.

5417. YU, SHEN. [Landscape architecture.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 9: 848-856. Pl. 1-26. 1924.—This is a brief treatise on landscape architecture; it includes the definition, a historical sketch, and discusses the scope, designs, and the training for the art.—*Chunjen C. Chen*.

5418. ZIMMERLY, H. H. *Spinach fertilizers*. Virginia Truck Exp. Sta. Bull. 44. 281-291. 1923.—The composition of commercial fertilizers with reference to availability of N during the colder part of the year is of especial importance in spinach production. A comparison of NaNO_3 , tankage, and 1 2 tankage + 1 2 nitrate as sources of N showed only slight differences on the fall crop planted Sept. 12, but on the winter crop, planted October 7, the tankage plots produced no crop, and tankage + nitrate was much inferior to nitrate alone. The use of 1600 pounds per acre of 9-8-3 fertilizer in 4 applications was somewhat superior to the same amount in 2 applications. Sulphate of ammonia produced equivalent results to nitrate of soda in the fall crop, but was somewhat inferior in the winter crop. The mean air temperatures during the period of the winter crop were: November, 55°F.; December, 43°F.; January, 41°F.; February, 45°F.; March, 48°F. It is claimed that the soil temperatures during this period were too low for the decomposition of tankage, hence N for winter crops should be supplied in the nitrate or ammonium form, or as a mixture of these ingredients.—*J. T. Rosa*.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 5040, 5132, 5162, 5549, 5550, 5763, 5828, 5106, 5939)

5419. ABELE, KARL. *Untersuchungen an Gametophyten von Peperomia incana*. [The gametophyte of *Peperomia incana*.] Bot. Archiv. 7: 321-324. Fig. 1-6. 1924.—The haploid chromosome number of *P. incana* is 11. The embryo sac contains 16 nuclei. There is 1 egg nucleus and 1 synergid. The remaining 14 nuclei are distributed freely in the plasma. Fusion groups were not observed. Ephemeral cell plates are formed. The generative nucleus of the pollen is long.—*William Seifriz*.

5420. ARBER, AGNES. *On the leaf-tips of certain monocotyledons*. Jour. Linn. Soc. Bot. London 45: 467-476. Fig. 1-14. 1922.—The author has studied the tips of monocotyledonous leaves from the standpoint of the phyllode theory. On evidence of comparative morphology and anatomy she believes that in the case of simple foliage leaves terminating in a solid apex, and also in spathe-leaves ending similarly, the main part of the leaf is of leaf-sheath nature, the solid tip representing a vestigial petiole. In more complex leaves which are differentiated into sheath, stalk, and "blade," there are cases where the "blade" terminates in a solid apex; in such cases it is provisionally suggested that the solid apex represents the distal, unexpanded portion of the petiole, the remainder of the distal portion having developed into the "pseudo-lamina."—*A. J. Eames*.

5421. BEALS, CORA M. *An histological study of regenerative phenomena in plants*. Ann. Missouri Bot. Gard. 10: 369-384. Pl. 15-18. 1923.—From a study of the anatomy of *Bryophyllum* under experimental conditions and a review of the literature on the subject the author concludes "that regeneration occurs (1) from the cambium cells when they are abundantly present and fully developed, as in the horseradish, sweet-potato, and parsnip, (2) from the young epidermal cells of seedlings before the central cylinder has a well developed

cambium, as in the flax seedlings, and (3) from the small and actively dividing cells of the phloem, as from the veins of the leaves of *Bryophyllum*."—S. M. Zeller.

5422. BROUGH, PATRICK. Preliminary note on the embryo sac of *Styphelia longifolia* R. Br. Proc. Linn. Soc. New South Wales 48: 674-680. 12 fig. 1923.—*Styphelia longifolia* is an Australian shrub belonging to the *Epacridaceae*. Certain rather unusual features of the megasporogenesis and development of the embryo sac are discussed. The ovule has a single massive integument, investing a nucellus consisting of an axial row of cells enclosed by a single layer of cells. The hypodermal cell, at the apex of the axial row of the nucellus, functions as the megaspore mother cell. No parietal tissue is produced. The megaspore mother cell divides and produces a linear tetrad of 4 megaspores, the outermost of which functions, a somewhat unusual character though previously observed in the Sympetalae. This develops the female gametophyte, which at maturity is of normal type. An outstanding feature of the embryo sac is the extraordinarily large pyriform synergids, each with a distinctly striated apical region. The antipodal cells are insignificant and evanescent. The polar nuclei fuse prior to fertilization. The 3 innermost megaspores are non-functional, but enlarge and persist with unimpaired vitality until after fertilization, perhaps acting as passageway for nutritive materials. The endosperm develops rapidly. A micropylar chamber, suggesting a parallel to that described by Peltriset in the *Ericaceae*, is formed at the apical end of the embryo sac. The long suspensor of the embryo traverses the micropylar chamber, passes through the constriction in the sac, and leads to the embryo which is embedded deep in the endosperm.—Eloise Gerry.

5423. CLEGG, GLADYS G., AND SYDNEY CROSS HARLAND. A study of convolutions in the cotton hair. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 15: T 14-26. Fig. 1-20. 1924.—The number of convolutions in any portion of a single cotton hair depends on the ratio of ribbon width to wall thickness. Wetting the hair causes a partial elimination of convolutions and a less elimination of reversals, but, on drying again, the convolutions and reversals return almost unmodified to their original positions. Boiling the hairs under pressure causes an almost complete disappearance of both convolutions and reversals, accompanied by much swelling; but, on drying, the original character of the hair in regard to both is reproduced. Tension causes the pulling out of some of the convolutions, but the reversals remain largely unaffected. On release of tension there is a distinct tendency for the hair to resume its original form. Data are presented of convolutions per mm., reversals per mm., ratio of convolutions to reversals, and ratio of right-handed to left-handed convolutions in various types of cotton. Curves showing the distribution of convolutions and reversals along the cotton hair indicate that both are predetermined during growth in length, and the convolution curves from daily pickings provide further evidence on this point. The results obtained on the mode of distribution of convolutions along the hair are in substantial agreement with those of Balls and Hancock. The conclusion of Bowman that a relation exists between the fineness of a cotton and the number of convolutions per unit distance is not substantiated. The existence of a generalized form of convolution curve is established; this consists of a 2-peaked curve with a pronounced dip about the middle of the hair. To account for the symmetrical shape of the convolution curve it is suggested that growth in length of the hairs takes place mainly in or near the middle of the hair.—From authors' summary.

5424. CLEGG, GLADYS G., AND SYDNEY CROSS HARLAND. The measurable characters of raw cottons. The determination of area of cross section and hair weight per centimeter. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 489-492. 1923.—The necessity for quantitative investigations on the properties of single hairs is emphasized, and methods for the evaluation of mean area of cross section and hair weight per cm. are described. To obtain a mean value subject to a maximum probable error of not more than 3% of the mean entails great care in sampling, and the following minimum number of observations: 140 for area of cross section, 80-160 for hair weight per cm. Data on area of cross section and hair weight per cm. are presented for 5 cottons, but the existence of an unknown amount of expansion when the hair is cut renders the figures for area of cross section of doubtful value except for comparative purposes. Calculations of specific volume, apparent density, and porosity of 4 cottons show that the amount of pore space varies from 32% to 41%, and,

in general, the amount of pore space increases with the coarseness of the cotton.—*Authors' summary.*

5425. COOK, M. T. **Development of seed of *Crotalaria sagittalis*.** Bot. Gaz. 77: 440-445. Pl. 30-31. 1924.—Observations are made on fertilization and on the development of the nucellus, endosperm, embryo and seed coat in *Crotalaria sagittalis*. In general, the main developmental features conform to those typical of the Leguminosae and only as exceptional features were such phenomena as branching pollen tubes, pollen tubes parasitic on embryo sac, and polyembryony noted.—A. C. Martin.

5426. DIXON, H. H., AND N. G. BALL. **The vascular supply of the haustorial cotyledon of *Lodoicea* and *Phoenix*.** (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 488. [1924.]

5427. FUCHS, A., AND N. ZIEGENSPECK. **Aus der Monographie des *Orchis Traunsteineri*. V. Die Pilzverdauung der Orchideen.** [From the monograph of *Orchis Traunsteineri*. V. The digestion of fungi by orchids.] Bot. Archiv. 6: 193-206. 1 pl. 1924.—The more shady a locality is, the thicker and more numerous are the roots of orchids. Many roots thus form lateral outgrowths of thick spherical shape which possess a pronounced fungal digestive layer. Even where the parent root dies these stump roots continue to live. During the period of rest these stump roots are meta-cutinized and live thus in the soil like pro-corms. Later, a bud develops at the pole opposite the point of connection with the parent root, and grows into a rhizome.—William Seifriz.

5428. GIMESI, NÁNDOR. **A *Bidens*-fajok virágának fejlődése.** [The development of the flower in the genus *Bidens*.] Botanikai Közlemények 19¹⁶: 66-80. Fig. 1-6. 1920-1921.—The development of the flower in *Bidens* corresponds in general to that in the Compositae. The upper part of the ovary is occupied by the "dents"—the terminations of the fibro-vascular system. In the psilocarpic species of *Bidens* the number of "dents" is more frequently 5, as in the section *Platycarpae*, where tripartition is more frequent. The bifurcations of the 4 chief collateral fibrovascular bundles lead to the 5 parts of the calyx and corolla. The teratology of *Bidens tripartita* shows that the ancestors of species of *Bidens* have, between the collateral chief fibrovascular bundles, well developed intermediary bundles which in the same manner serve for carrying nutrients and for mechanical support.—Gy. Istvánffi.

5429. GOEBEL, K. **Archegoniatenstudien. XVI. Vittariaceen und Pleurogrammaceen.** [Studies in the Archegoniatae. XVI. Vittarieae and Pleurogrammeae.] Flora 117: 91-132. 12 fig. 1924.—The author finds that several ferns classed with the Vittarieae should be placed in the Pleurogrammeae. He takes as the distinguishing characters of the Vittarieae their anatomical structure (spicular cells, lack of sclerenchyma in the stem, clathrate paleae), the sporangial characters (4 stomium cells, numerous annulus cells), and the peculiar type of prothallium found in all forms in which it is known. All the genera of the Vittarieae are derived from *Antrophyum*. *Anetium* is connected by the structure of its sporangium and by anatomical characters. In *Hecistopteris* reduction has occurred; the mature leaf of *H. Werckleanum* is similar to the juvenile leaf of *Antrophyum obtusum*. In the Vittaria line, the limiting of the sori to the lengthwise veins is related to the narrowing of the leaf. *A. lineatum* and *Pteropsis angustifolia* (unquestionably a member of the Vittarieae) are transition forms. In *Vaginularia*, only in the fertile leaf are there lateral veins; this appearance has been misinterpreted as a "splitting of the mid-rib." The union of *Pleurogramme* with *Monogramme* is given up. The characteristics of the Pleurogrammeae are sclerenchyma in the stem, no spicular cells, no clathrate paleae, peculiar stomium of 2 cells, and spores with chlorophyll which may germinate within the sporangium. The prothallium is not with certainty known. The South American species of *Pleurogramme* differ from the Asiatic sufficiently to be placed in a separate genus. In *P. seminuda* there are forms which represent at least 2 species—*P. seminuda* and *P. nuda*. Three species placed in *Vittaria* (*V. falcata*, *V. pusilla*, *V. sulcata*) belong to *Pleurogramme*.—A. G. Stokey.

5430. GOEBEL, K., UND K. SÜSSENGUTH. **Beiträge zur Kenntnis der südamerikanischen Burmanniaceen.** [South American Burmanniaceae.] Flora 117: 55-90. Pl. 2-3, 2 fig. 1924.—This paper treats of the morphology, anatomy, and classification of 2 saprophytic species of the Burmanniaceae—*Thismia Leutzelburgii* (n. sp.) from Brazil, and *Cymbocarpa Urbani* (n. sp.) from Venezuela. *T. Leutzelburgii* belongs to the section *Ophiomeria* of the genus

Thismia, and in the form of its flower lies between *T. Macahensis* Miers and *T. janeirensis* Warming. It is a most highly reduced type of saprophyte. *C. Urbani* should not be confused with *C. refracta* Miers, as happened in the case of material collected by Urban and described in "Symbolae Antillanae."—A. G. Stokey.

5431. GRAVIS, A. Nouvelle réponse à M. G. Chauveaud. [New reply to M. G. Chauveaud.] Bull. Soc. Bot. France 70: 286-287. 1923.—A controversy concerning basal acceleration and phyllorhiza in *Urtica* and *Tradescantia* is discussed.—P. A. Young.

5432. GSCHIEDLE, A. Über Haustorienbildung in der Gattung *Veronica* und ihre systematische Wertung. [Haustoria in the genus *Veronica* and their systematic value.] Flora 117: 144-172. 34 fig. 1924.—In *Veronica* the haustorial development of the embryo sac, particularly at the chalazal end, is found to show types as distinct as those which are usually associated with generic groupings. The types are definitely correlated with the subdivisions of the genus. It is suggested that the type of haustorium may be of value in determining the position of difficult species.—A. G. Stokey.

5433. GUMPPENBURGER, OTTO v. Beiträge zur Entwicklungsgeschichte der Blumenblätter mit besonderer Berücksichtigung der Nervatur. [Development of floral leaves with special reference to venation.] Bot. Archiv. 7: 448-490. Pl. 1-18. 1924.—A detailed description of the meristem and developmental growth of veins in foliage leaves is given.—William Seifriz.

5434. LANG, W. H. The organisation of the plant in the vascular cryptogams in the light of fossil history and causal morphology. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 490. [1924].

5435. METZLER, WILHELM. Beiträge zur vergleichenden Anatomie blattsukkulenter Pflanzen. [Comparative anatomy of leaf succulents.] Bot. Archiv. 6: 50-83. 5 pl. 1924.—There are pronounced differences in the development of the epidermis in families with succulent leaves. The epidermis may be a firm skin serving to retain water in the leaf or may serve as the water reservoir itself, or it may possess neither of these functions. As an organ for retarding transpiration it, again, has different structures. In agaves and aloes the epidermis has a pronounced thickening of the cuticular layer, a prominent wax coating, and storage of silica granules. In the epidermis of the bromeliads it is the inner and side walls which are markedly thickened, beneath which lies a sclerenchymatous hypodermis. The outer wall is here only slightly thickened.—William Seifriz.

5436. REYNOLDS, LILLIAN GRACE. Female gametophyte of *Microcycas*. Bot. Gaz. 77: 391-403. Pl. 28-29, fig. 1-6. 1924.—The ovules were not young enough to show the megaspore mother cells or the megaspores, the youngest stage of the female gametophyte showing free nuclear condition in the megaspore. In the older ovules, nuclear division had increased the number of free nuclei, while at the periphery some of the nuclei are already inclosed by walls. Still older ovules show the gametophyte to be completely cellular. The number of chromosomes is 12, although occasional nuclei have 14. The megaspore membrane increases in thickness from 1.5 μ in August to 3 μ in October, and thereafter decreases to 1.0 μ in March. The cells of the nucellus adjacent to the gametophyte are early organized into a nutritive jacket which persists until the middle of December. The archegonial initials are distinguishable about the latter part of November. They are scattered in groups over the surface of the gametophyte, but only those at the micropylar end develop. Haustoria from the egg protrude through the pores in the egg membrane into the cells of the archegonial jacket which surrounds each archegonium. The archegonial chamber is a shallow depression occurring late in the development of the gametophyte, and is not nearly so highly developed as in other genera. *Microcycas* should be regarded as one of the more advanced cycads.—L. G. Reynolds.

5437. SAUNDERS, E. R. Evolution and reversion in the Rhoadales. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 485-486. [1924].

5438. SCHACHNER, JOSEF. Beiträge zur Kenntnis der Blüten- und Samenentwicklung der Scitamineen. [Flower and seed development in the Scitamineae.] Flora 117: 16-40. Pl. 1. 1924.—A study of the development of the flower shows that the morphological nature of the labellum is not uniform in the Zingiberaceae. In *Hedychium* it is formed by the 2

lateral members of the inner whorl of stamens; in *Zingiber* there are in addition the 2 lateral members of the outer whorl; in *Costus* it is formed by the 2 lateral members of the inner and all of the outer whorl. In the Marantaceae the genera differ from each other only in the degree of reduction of the outer whorl. In the Cannaceae the outer whorl has 2 petaloid stamens; the inner, 2 petaloid and a half fertile stamen. The half fertile stamen of the 2 latter families is derived entirely from the inner whorl, and not in part from the outer as reported by Costerus.—Self-pollination is found to occur in several genera.—The wall of the perisperm-canal, present in the ovule of the Marantaceae, consists of soft chalazal tissue surrounded by thick-walled cells of the perisperm. The ovule has 2 integuments but the inner is suppressed and the seed-coat, even the stony layer, is formed entirely by the outer integument.—A. G. Stokey.

5439. SCHLIMBACH, H. Beiträge zur Kenntnis der Samenanlagen und Samen der Amaryllidaceen mit Berücksichtigung des Wassergehaltes der Samen. [The ovule and seed of the Amaryllidaceae with a consideration of the water content of the seed.] *Flora* 117: 41-54. 1924.—In the Amaryllidaceae there is a wide range in the character of ovule and seed with regard to integuments, seed coat, embryo sac, embryo, reserve food, and water content of seed. The seed of many species of this family greatly exceed the usual water content of seed (18%). A low water content (11% in *Alstroemeria*) is correlated with a well-developed embryo which can germinate at once; a high water content (92% in *Crinum*, 83% in *Nerine*) with a small undifferentiated embryo which requires a period of after-ripening. This relation was found to exist also in other families, as was shown by the seed of *Eranthis*, *Hedera helix*, *Corydalis* and *Puschkinia*, all of which have a water content of 50% or over.—A. G. Stokey.

5440. SCOTT, D. H. The early history of the stele. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 490. [1924].

5441. SHIRLEY, JOHN, and C. A. LAMBERT. On *Coprosma Baueri* Endl. *Proc. Roy. Soc. Victoria N. S.* 35: 19-23. 1 pl. 1922.—*Coprosma* is a genus of the Rubiaceae with 60 species chiefly in New Zealand and Australia. The authors studied the histology of the leaves of *C. Baueri*. They found pits on each side of the midvein, at junctions with primary veins. The numbers vary from 4 to 9. Those in the lower part of the leaf are often immature and closed when the upper ones are mature and open. Pits rarely occur on primary veins and then singly. They are irregular and beset with numerous unicellular nucleated and non-nucleated hairs. Each pit is lined with epidermal cells and covered with cutin. No stomata were found in them.—The detailed structure of a 3-layered epidermis is figured and measurements are recorded. The epidermis is clothed externally by cutin $\frac{1}{2}$ – $\frac{3}{4}$ as thick as the outer cell layer. The cells of the 2nd epidermal layer show no contents, the 3rd layer forms a transition between the 2nd and the palisade cells. Next come palisade cells (3 rows), spongy parenchyma with small intercellular spaces communicating with the outer air through the stomata, unless they are near a pit. The lower epidermis is made up of a single layer, the cells of which have bluntly conical points on the free surface. Numerous unicellular hairs coat the lower leaf surface.—The structure of the midrib and of the stem is described and figured. The peculiar depth of the stem bast layer is noted. The medullary rays are 3-4 cells wide. The outer ray cells show circular bordered pits which are absent in the inner cells.—The theory of Lundström and others, that the pits are domatia or homes of commensal insects, is discussed. In none of the leaves examined did the authors find insects in the pits and they conclude that the pits are not domatia. To test whether the pits were sources of moisture supply to the leaf, pits in healthy leaves attached to the plant were filled with a quick-drying varnish. The leaves still continued to flourish, leading the authors to conclude that the pits are not now necessary for this purpose, although they may have been under xerophytic conditions.—Eloise Gerry.

5442. SHULL, J. MARION. The skunk cabbage. *Gard. Chron.* III. 73: 333. Fig. 163-164. 1923.—Notes are given on the root and development of the flowers and fruit, in correction of a statement in *Gard. Chron.* for Apr. 14, 1923, by F. G. PRESTERS.—P. L. Ricker.

5443. SOEDING, HANS. Anatomie der Wurzel-, Stengel- und Rübenbildung von Oelraps

und Steckrübe. (*Brassica Napus* L. var. *oleifera* und var. *napobrassica*.) [Anatomy of the root and stem of the rape and turnip.] Bot. Archiv. 7: 41-69. Fig. 1-39. 1924.—A comprehensive anatomical study with observations on the phylogeny of the winter-rape and turnip is given.—*William Seifriz*.

5444. SZABÓ, Z. A *Dipsacus silvestris torsus* De Vries tenyésztése a budapesti tudományegyetemi növénykertben. [The culture of *Dipsacus silvestris torsus* De Vries in the Botanical Garden of Budapest.] Botanikai Közlemények 19¹⁻⁶: 94-96. 1920-1921.—Fruits of *Dipsacus silvestris torsus* De Vries were received from Munich in 1916 and in 1918. Without any special care both produced entirely normal progeny. For the author's studies of the fibrovascular system fruits grown in 1916 and 1918 were planted April 2, 1920, and on the recommendation of De Vries 180 were planted in heavily manured beds at a distance of 50 cm. apart. From the 180 planted, there developed the following spring (1921) 18 normal specimens (10%); 75 tall plants with triple rosettes (41.7%); 35 with partial torsion (19.4%) and 52 with full torsion of the main axis (28.9%).—*Gy. Istvánffi*.

5445. SZALAY, EDITH. Adatok a szalmavirágok szövettanához. [Contribution to the histology of immortal flowers.] Botanikai Közlemények 19¹⁻⁶: 30-44. Fig. 1-4. 1920-1921.—The author investigated the anatomy of involucre leaves of immortelles (*Carlina*, *Xeranthemum*, *Helichrysum*). In the species investigated the involucre leaves consist of dead and lignified cells, except that in the lower part of the involucre of *Xeranthemum* and in the outer involucre of *Carlina* assimilatory cells are present also. The periphery of the involucre consists of an epidermis of 1 cell-layer with strongly developed cuticle on the upper side and with numerous stomata on the lower side. Beneath the epidermis is a sclerenchymatous hypodermis which is highly developed on the lower side of the leaf but insignificant on the upper side. The wall of the sclerenchymatous cells is highly lignified. Calcium oxalate crystals are present in the involucre leaves. All the cells of the parenchyma mentioned are filled with air. Hygroscopic movements are made by the involucre leaves, due to imbibition and desiccation; they serve for both nutrition and mechanical support.—*Gy. Istvánffi*.

5446. TAKENOCHI, YOSHIO. Morphological studies on the leaf-blades of sugar-canes. (Japanese). Rept. Agric. Dept., Res. Inst. Formosa 1: 1-93. 8 pl. 1922.—This paper contains the results of anatomical investigations on leaf-blades of various races of sugar-canes. The author has studied form and size of leaf-blades, their anatomical structure, stomata, size of cells situated between stomata, vascular bundles, trichomes, etc. In the 1st chapter the general results of the researches are described and in the 2nd the results of comparative studies on 15 different races are enumerated.—*Author*. (Courtesy Japanese Jour. Bot.)

5447. THOMAS, E. N. M. Observations on the seedling anatomy of the Ebenales. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 491. [1924].

5448. THOMPSON, J. McL. Developmental morphology and its bearing on the systematic physiology. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 490-491. [1924].

5449. THOMPSON, R. B., AND H. B. SIFTON. Resin canals in spruce wood. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 492. [1924].

5450. WETZEL, KARL. Beitrag zur Anatomie der Saughaare von Bromeliaceen. [Anatomy of the absorption hairs of the Bromeliaceae.] Flora 117: 133-143. 7 fig. 1924.—The hairs of *Tillandsia* spp. consist of 2 parts: (1) the trichome cover which is a more or less regularly arranged plate of cells with walls of cellulose and pectin, uncutinized except for a narrow zone; and (2) the living absorption cells, 3-4 cells which form a cone-shaped structure with its base attached to the trichome cover. Wetzel finds that the walls of the absorption cells are not completely cutinized, as has been reported, but that the periclinal walls have in the center a sharply delimited uncutinized area which acts as a permeable diaphragm permitting the ready passage into the leaf of the water taken up by the trichome cover.—*A. G. Stokey*.

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*
L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 5107, 5122, 5131, 5133, 5159, 5162, 5168, 5169, 5170, 5498, 5556, 5564, 5790)

5451. ATKINS, W. R. G. Seasonal changes in water in relation to the algal plankton. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 491. [1924.]

5452. CHEMIN, E. La sensibilité au contact chez les algues. [Sensitiveness to contact in the algae.] Rev. Algologique 1: 213-222. 5 fig. 1924.—Local fusion of branches may occur where these rest in contact for a time, as in *Lomentaria clavellata*, *Calliblepharis jubata*, etc.; or even between plants of different genera, as in *Gigartina acicularis* and *Rhodomenia Palmetta*. Tendriliform tips are present in *Calliblepharis jubata*, which may clasp the filaments of other algae. In *Cystoclonium purascens* the slender ultimate filaments may bend and entangle, and this plant may not only entangle with other algae but unite with them, for example, with *Rhodomenia palmata*. Bending of these tendrils probably occurs rather by the stimulation of young cells to division than by elongation and special modification of other cells.—Wm. Randolph Taylor.

5453. DEFLANDRE, G. A propos de l'Euglena acus Ehrb. Rev. Algologique 1: 235-243. Pl. 4. 1924.—A proposal for uniting into *E. acus* Ehrb. the forms *E. acus (typica)*, its varieties *minor* Hansg. and *rigida* Hueb., *E. acutissima* Lem. and *Phacus acutissimus* Bernard, is discussed. Tabular data are given for 2 preserved collections from near Rambouillet (Seine-et-Oise). In the light of these data the characters of value for the distinguishing of forms in this group are listed. The following are accepted: *E. acus* Ehrb. (*typica*) and the varieties *rigida* Hueb., *van Oyei*, n. var., and *longissima* n. var.—Wm. Randolph Taylor.

5454. DENIS, M. Observations algologiques dans le Hautes-Pyrénées. II. [Algal observations in the high Pyrenees. II. Conclusion.] Rev. Algologique 1: 258-266. 1924.—In lakes of high altitudes the plankton is composed of diatoms and is very scant. Two main non-planktonic associations are observed: (1) In peaty water the association is characterized by *Micrasterias truncata* and *Frustulia saxonica* with blue-green algae, Protococcales, and several desmids; and (2) in clear cold water, by *Diatoma hiemale*, with other diatoms and a few desmids.—Wm. Randolph Taylor.

5455. Еленкин, А. А. [Elenkin, A. A.] О двух Видах Хроококсовые из Олонецкой губ. [Two species of Chroococcaceae from Olonets province.] Ботанические Материалы Института Спорных Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 20-24. 1923.—In addition to the Russian text, a Latin diagnosis is given of *Chroococcus helveticus* Naeg. var. *consociato-dispersus* n. var. *Synechococcus crossus* Arch. is also described.—Frederick V. Rand.

5456. Еленкин, А. А. [Elenkin, A. A.] О новых видах и формах из родов Characium A. Br. и Characiopsis Borzi симбиотирующих с Crustacea. [New species and forms of Characium A. Br. and Characiopsis Borzi symbiotic with Crustacea.] Ботанические Материалы Института Спорных Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 17-30. 1924.—Discussion is given in Russian of the following new species and forms: *Characiopsis groenlandica* (P. Richter) Lemmerm., and its var. *rossica* Elenk., *C. (?) crustacearum* Elenk., *Characium michailovskoëense* Elenk., and its var. *angustius* Elenk.—Frederick V. Rand.

5457. Еленкин, А. А. [Elenkin, A. A.] Descriptio specierum formarumque novarum e gen. Characium A. Braun et Characiopsis Borzi cum Crustaceis symbiomaticis. [Description of new species and forms from the genera Characium A. Braun and Characiopsis Borzi symbiotic with Crustacea.] Ботанические Материалы Института Спорных Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 33-36. 1924.—Latin diagnoses of the following are given, Elenkin being the authority: *Characiopsis groenlandica* (P. Richt.) Lemmerm. var. *rossica* n. var., *C. (?)*

crustacearum n. sp., *Characium michailovskoënsë* n. sp. and its var. *angustius* n. var.—*Frederick V. Rand.*

5458. ЕЛЕНКИН, А. А. [Elenkin, A. A.] О новой форме из рода *Chlorangium* Stein., живущей на личинках комара. [A new form of *Chlorangium* Stein., living on larva of *Culex*.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 37-43. 1924.—Following the Russian text, a full Latin diagnosis is given of *Chlorangium stentorinum* (Ehrenb.) Stein f. *culicis* Elenk. n. f.—*Frederick V. Rand.*

5459. FREMY, P. Contribution a la flore algologique de l'Afrique Equatoriale Francaise. [Contribution to the algal flora of French Equatorial Africa. Concluded.] Rev. Algologique 1: 244-257. 1 fig. 1924.—Some new collections not included in the 1st report are here listed, and the groups omitted in that paper are introduced as follows: Flagellatae, 3; Volvocales, 1; Protococcales, 14; Ulothricales, 6; Oedogoniales, 3; Desmidiaceae, 18; Zygnemaceae (*Mougeotia capucina* (Bory) Ag., a new record for Equatorial Africa; the figure shows conjugation between 2 cells of the same filament as well as cross conjugation); Heterokontae, 1; and Bacillarieae, 8.—*Wm. Randolph Taylor.*

5460. FRITSCH, F. E. British Desmidiaceae. [Rev. of: WEST, W., AND G. S. WEST. A monograph of the British Desmidiaceae. Vol. 5 by NELLIE CARTER. xxi + 300 p. 39 pl. Printed for the Ray Society: London, 1923.] Nature 114: 783-784. 1924.

5461. GEITLER, L. Die Entwicklungsgeschichte von *Sorastrum spinulosum* und die Phylogenie der Protococcales. [The developmental history of *Sorastrum spinulosum* and the phylogeny of the Protococcales.] Arch. Protistenk. 47: 440-447. Pl. 22, 2 fig. 1924.—After aging and growth of the cell with consequent changes of form, reproduction is initiated by division of the chromatophore into several parts, the pyrenoid remaining undivided and subsequently disappearing. The cell having previously become multinucleate, the plasma mass then divides up into zoospores within the cell wall. The zoospores are spherical, each possesses a nucleus and a chromatophore, and they have a vibratory motion. Eventually the maternal membrane breaks and sets them free. Development may begin before extrusion, so that all stages from 4 to 32 cells may be found in a colony. On the basis of developmental history, the Protococcales may be divided into 2 groups, one with simultaneous divisions, the other with successive divisions. The following forms belong to type I: *Tetraedon*, *Characium*, *Scenedesmus*, *Coelastrum*, *Sorastrum*, *Pediastrum*, and *Hydrodictyon*. To type II are assigned: *Chlorococcum*, *Chlorochytrium*, *Cystococcus*, *Chlorella*, and *Dictyosphaerium*. In some instances after culturing, when the chromatophores in *Sorastrum* divided, the pyrenoids likewise divided, a modification abnormal for this form.—*Harold Kirby, Jr.*

5462. GROVES, J. Notes on Indian Charophyta. Jour. Linn. Soc. Bot. London 46: 359-376. Pl. 35-36. 1924.—This paper contains keys to the genera and species of Indian Characeae and a list of species with descriptions and notes. The author describes the following species as new: *Nitella mirabilis* Nordstedt, and *N. Wattii*.—*A. J. Eames.*

5463. GROVES, J. On Charophyta collected by Mr. Thomas Bates Blow, F. L. S., in Ceylon. Jour. Linn. Soc. Bot. London 46: 97-103. Pl. 6. 1922.—Thirteen species are listed, with data and descriptive notes. *Nitella leptodactyla* and *N. mucosa* are described as new.—*A. J. Eames.*

5464. GRUBB, V. M. Observations on the ecology and reproduction of *Porphyra umbilicalis* (L.) J. Ag. Rev. Algologique 1: 223-234. 4 fig. 1924.—This species grows on stones or wood-work, rarely on other algae, and in the upper part of the littoral zone on the Faroes reaches up to 50 feet above high tide. At Swanage it is a winter plant, and in some other places also shows this habit, but in the north, as on the Faroes, it persists through the summer. At Swanage and on the west coast of Sweden, asexual spores are absent in reproduction. Male thalli begin to form the spermatia by division of the marginal cells: all but the hold-fast cells may finally function. Female thalli bear procarpas as single elongate cells without trichogynes. A clear passage seems to be formed between the spermatia and the procarpas, but nuclear fusion was not observed. The fertilized carpogonium gives rise to 8 spores. Germination of carpospores has not been successfully followed to the mature plant. Long filaments can be obtained, and the protoplast of the end-cell was observed to slip out of the wall.—*Wm. Randolph Taylor.*

5465. HAMEL, G. Floridees de France. [Florideae of France.] Rev. Algologique 1: 278-292. Fig. 1-2. 1924.—This first section of a general presentation contains the Bangiales in part, with keys and descriptions and full taxonomic data.—Wm. Randolph Taylor.

5466. HAMEL, G. Quelques Cladophora des cotes Françaises. II. [Some Cladophora of the French coast.] Rev. Algologique 1: 293-297. 2 fig. 1924.—This section contains part of the Breviarticulatae, namely *C. catenata* (Ag.) Hauck and *C. Hutchinsae* (Dillw.) Kütz., with a key to the group and full taxonomic data.—Wm. Randolph Taylor.

5467. Голлербах, М. М. [HOLLERBACH, M. M.] О стадиях развития *Gloeocapsa magma* (Bréb.) Kütz. [Note on the stages of *Gloeocapsa magma* (Bréb.) Kütz. Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 1-8. 1924.—Following the Russian text is given a discussion in Latin of *Gloeocapsa magma* (Bréb.) Hollerb. emend., including historical data, exsiccati, diagnosis, habitat, and varieties.—Frederick V. Rand.

5468. HUSTEDT, F. Zur Morphologie und Auxosporenbildung von *Melosira Jurgensi* Ag. und *M. arenaria* Moore. [Morphology and auxospore formation in *M. Jurgensi* and *M. arenaria*.] Arch. Hydrobiol. u. Planktonk. 14: 720-725. Pl. 8. 1924.—*Melosira Jurgensi* constructs long chains with cylindrical links, each 2 cells separated by a cushion of jelly which is usually very narrow but may be much broadened. The valves have a cylindrical mantle surface and a vaulted disc excavated in the middle portion. The surface of the valves is finely punctuated, the appearance being due to the canals penetrating the walls. The wall appears to be 2 layered. There is no inner closure of these pores, as has been described in some forms. The girdle bands seem to be composed of individual rings of variable width. Auxospores are formed in the spring, beginning in the younger half of the mother cell. With the swelling of the auxospore the girdle band bursts, and the older shell is pushed forward. Shells form and the auxospore is complete. Auxospores are formed quite similarly in *M. arenaria*.—Harold Kirby.

5469. ИКОМА, Y. Distribution of tropical algae in Japan Sea. (Japanese.) Bot. Mag. Tôkyô 38: 123. 1924.—The following species are discussed: *Caulerpa Okamurai* Weber v. Bosse, *C. scalpelliformis* (R. Br.) Ag. var. *denticulata* (Decne.) Weber v. Bosse, *Halophila ovata* Gaud., *Acetabularia caraiibica* Kütz., *Eudesme virescens* (Carm.) J. Ag., *Trichogloea lubrica* (Harv.) J. Ag., *Galaxaura* sp., and *Liagera* sp.—Frederick V. Rand.

5470. Косинская, Е. К. [Kosinskaia, E. K.] О новой синезеленой водоросли из рода *Calothrix* Ag. [A new species of *Calothrix* Ag.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt Hort. Bot. Reipubl. Rossicae] 3: 9-11. 1924.—Following the Russian text is a Latin diagnosis of *Calothrix Elcnkini* n. sp.—Frederick V. Rand.

5471. LEBLOND, E. Algues du littoral septentrionale du Golfe d'Ajaccio (Corse). [Algae of the northern shores of the Gulf of Ajaccio (Corsica). Concluded.] Revue Algologique 1: 267-271. 1924.—One species of *Heterokontae*, 12 *Conjugatae*, 13 *Bacillariae* and 39 *Chlorophyceae* are included.—Wm. Randolph Taylor.

5472. LLOYD, F. E. Conjugation in *Spirogyra* (Preliminary summary). Trans. Roy. Canadian Inst. [Toronto] 15: 129-133. Pl. 10. 1924.—Sexual reproduction falls into 3 stages: Maturation, gametic fusion, and zygotic contraction. (1) Maturation: The origin of the gametes is traceable to the last cell divisions preceding conjugation; the gametes show restricted growth and at maturity present the following ratios in length: 46 (male) to 63 (female) to 100 (vegetative cells). The conjugation tube originates as 2 outgrowths always in contact. The newly formed septum registers changes in pressure as between the male and female; the gametes come into contact through a minute pore and unite under conditions of high surface tension. During maturation, starch and mucilage have increased; the turgor of the gametes has been reduced in the male more than in the female; decrease of permeability and a differential alteration in viscosity take place; and the male becomes attached to the septum.—(2) Gametic fusion: The male gamete undergoes transverse contraction and the movement of the male cytoplasm begins. The rapid loss of water, first in the male and much later in the female, is accomplished by means of numerous contractile

vacuoles which discharge pure, or almost pure, water.—(3) Zygotic contraction proceeds in the same manner.—The species studied was *S. longata*.—*Author*.

5473. MAZZA, ANGELO. Aggiunte al saggio di algologia oceanica (Florideae). [Appendix to the essay on oceanic algology.] Nuova Notarisia 35: 1-27. 1924.—The author continues his systematic and morphological studies of "The Florideae of the world." The species particularly described or discussed are *Bostrychia Hookeri*, *B. rivularis*, *Thuretia Bornetii*, *Dasyopsis spinella*, *D. plana*, *D. pumila*, *Dasya ocellata* and *D. rigidula*.—*Marshall A. Howe*.

5474. MOORE, G. T., AND NELLIE CARTER. Algae from lakes in the northeastern part of North Dakota. Ann. Missouri Bot. Gard. 10: 393-422. Pl. 20. 1923.—This paper, which is supplementary to a previous report of Algae from Devil's Lake, North Dakota includes a taxonomic list of 110 species, with 23 varieties and 3 forms.—*Rhabdoderma sigmoidea* is described as new. This description includes f. *minor*. Some ecological notes are given contrasting the flora of the fresh water and alkaline lakes, the former represented by 33 species of Myxophyceae and 75 species of Chlorophyceae, and the latter by 44 species of Myxophyceae and 42 species of Chlorophyceae.—*S. M. Zeller*.

5475. NAUMANN, EINAR. Die Lagertypen von Nostoc Zetterstedtii J. E. Areschoug. Eine morphologische Studie. [Types of Nostoc Zetterstedtii J. E. Areschoug.] Svensk Bot. Tidskr. 18: 529-541. 12 fig. 1924.—The author makes a thorough morphological study of the different types of this species found in nature. Some of these differ widely in structure and shape from the typical form of the species and resemble *N. coeruleum* or *N. pruniforme*. The author distinguishes 4 types according to the exterior: The typical form with small protuberances; the smooth form; the centrifugally corroded form; and the flattened form. These were investigated microscopically. In the typical form the algal trichomes run radially. Three kinds of cells occur: common vegetative cells, heterocysts and spores. Propagation took place through simple cell division and by spores. The spores take their origin from common cells; generally several spores lie in a row behind one another. Often they occur in big heaps within the mucilaginous layer surrounding the trichomes. Two sub-types of the common form occur, externally identical but differing in anatomical structure. One has perfectly radial trichomes; the other has large, scattered cell-aggregates. The former sub-type represents a minimum of spore-formation, the latter a maximum. Besides, all intergrades occur. In the smooth form, no real trichome-structure is found but the interior of the colony consists of a translucent jelly, except that immediately beneath the surface there is a green border of tangled threads. This form arises through formation of new trichomes from spore-heaps in the periphery of the colonies. In the corroded type the jelly in the interior, probably under the influence of bacteria, has been liquefied and has penetrated through the cortical layer which is thus more or less destroyed. The flattened type arises through regeneration of centrifugally corroded colonies. Thus all the different types have been found to stand in simple developmental interrelations.—*O. Heilborn*.

5476. NISHIMURA, MAKOTO. The theory of the formation of the spherical thallus in *Aegagropila Sauteri* (Nees.) Kütz. (Japanese.) Bot. Mag. Tôkyô 37: (105)-(117). 1 pl., 1 fig., 2 graphs. 1923.—The author's studies indicate that the small spherical thallus formation of *Aegagropila Sauteri* (Nees.) Kütz. is an example of the adaptation phenomenon in floating life. The important facts concerning the spherical thallus formation of the plant may be pointed out as follows: (1) The thallus gradually revolves by means of change in the center of gravity and the center of buoyancy in the course of its normal development. Consequently the new surface of the thallus is placed in the best condition for development. (2) In the preceding phenomenon, the revolution is aided by the characteristic migration of the plant, even in calm water. (3) In the beginning, the single thread of the thallus does not revolve easily, but when it becomes a small sphere it revolves usually by wave motion, because then both the center of buoyancy and the center of gravity come to one point in the center of the thallus. (4) The rhizoids of this plant act as connecting organs for the thallus. (5) The continual pressure of water acting equally on the whole surface of the thallus causes it to become more and more compact. In short, the spherical thallus of *A. Sauteri* is formed by the synthetic action of the preceding factors. This theory applies to *A. Sauteri* because

it has elastic cell walls; if its cell walls were soft it would never become a spherical thallus.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5477. OKAMURA, KINTARÔ. *Icones of Japanese algae.* 4¹⁰: 185-205. 5 pl.; 5¹: 1-19. 5 pl. 1923.—No. 10 of vol. 4 contains *Odonthalia ochotensis* (Rupr. J. Ag., *Symphyclocladia pennata* n. sp., *Trichogloea lubrica* (Harv.) J. Ag., *Plocamium costatum* (J. Ag.) H. & H., *Dasyphila plumarioides* Yendo, *Gelidium crinale* (Turn.) Lam. f. *latifolium* n. f., *Homoeostrichus Sinclairii* (H. & H.) J. Ag., *Desmarestia aculeata* (L.) Lam., *Caulerpa Freycinetii* C. Ag. var. *pectinata* Web. v. Bos., *C. cupressoides* C. Ag. var. *typica* Web. v. Bos., var. *lycopodioides* f. *elegans*, *Derbesia Lamourouxii* (J. Ag.) Solier.—No. 1 of vol. 5 contains *Cocophora Langsdorffii* (Turn.) Grev., *Sargassum Horneri* (Turn.) C. Ag., *S. Thunbergii* n. comb. (*Cystophyllum Thunbergii* J. Ag. combined with *Cystophyllum Swartzii* J. Ag.), *S. nigrifolium* Yendo and *S. duplicatum* J. Ag.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5478. PLAYFAIR, G. I. *Notes on freshwater algae.* Proc. Linn. Soc. New South Wales 48: 206-228. 30 fig. 1923.—These observations, completed just before the death of the author, consist of both morphological and taxonomic notes. Included in the account are observations on the development of *Chlamydomonas* from resting cells; colony formation in *Pandorina*, *Gonium*, *Selenastrum* and *Coelastrum*; rejuvenescence in *Gonium* and *Botryococcus*; the nature of the horns in *Pediastrum*; the development of *Euglena sociabilis* Dang. and of *E. torta* Stokes; and the structure of the cell in *Exuviella lima* (Ehr.) Schutt.—New species and varieties described are: *Chlamydomonas globosa* var. *maculata*, *C. ovata* var. *pulchra*, *C. mucicola* var. *rotundata*, *C. Snovii* var. *ovata*, *C. taurangensis*, *C. novaezealandiae*, *C. obscura*; *Chlorogonium elegans*, *C. Steinii* n. nom., *C. minimum* var. *curtum*, *C. minimum* var. *obesum*; *Pandorina morum* var. *cocnastroidea*; *Oocystis lismorensis*; *Scenedesmus Ralfsii* n. nom., *S. reniformis*; *Golenkinia aculeata*; *Ulothrix australica*, *U. quaternaria*; *Euglena australica*, *E. australica* vars. *gibberosa* and *claviformis*, *E. pisciformis* var. *granulosa*, *E. torta* vars. *obesa* and *curta*, *E. geniculata* vars. *guttula* and *juvenilis*; *Colacium ovale* and *C. arcuatum*.—G. M. Smith.

5479. RAPHELIS, A. *Additions à la flore des Algues de Cannes.* [Additions to the algal flora of Cannes. Concluded.] Rev. Algologique 1: 272-277. 1924.—Forty-three *Rhodophyceae* are listed, with notes on fruiting and habitat.—Wm. Randolph Taylor.

5480. ROSENVINGE, L. K. *Note sur le Zygnema reticulatum* E. Hallas. Rev. Algologique 1: 209-212. 1924.—This alga was found in 1895 by Mlle. E. Hallas on the Island of Amagen near Copenhagen. It forms spores by contraction of the cell contents. Germination occurs after 10 months, and in many cases each spore germinates to form 2-3 plantlets. The formation of the spores is preceded by an augmentation in the number of the chromatophores, and Mlle. Hallas reports cells with 2 nuclei as thought to be about to divide but which are to be considered rather as having fused. It is probable that a division and subsequent union give rise to a diploid nucleus for the spore. This plant is made the type of the new genus *Halassia* of the Mesotaeniaceae, relating this family to the Zygnemaceae.—Wm. Randolph Taylor.

5481. TAHARA, MASATO. *Keimentwicklung von Sargassum.* [Embryology of Sargassum.] (Japanese) Bot. Mag. Tôkyô 37: (159)-(161). 1923.—The oogonium of *Sargassum* has at first 8 nuclei; then 6 of them degenerate and the 2 that are left separate from each other toward the opposite poles. Following this the first cross wall develops in the equatorial plane and then in these 2 daughter cells the first nuclear divisions simultaneously take place. There is no 1-nucleate stage in the oospore.—*Author.*

5482. WILLIAMS, MAY M. *A contribution to our knowledge of the Fucaceae.* Proc. Linn. Soc. New South Wales 48: 634-646. 23 fig. 1923.—*Notheia anomala* is one of the few parasitic *Fucaceae*. The material studied was found parasitic on *Hormosira Banksii*. The thallus consists of epidermis, cortex and medulla. Food is obtained from the host by means of a haustorium consisting of a mass of elongated cells with conspicuous intercellular spaces. This haustorium penetrated the epidermis, cortex and medulla of the host. Oogonial conceptacles only were found, and from this the author concludes that reproduction is by means of a parthenogenetic development of the eggs. The oogene develops from a single cell and when mature contains 8 eggs.—The structure of the thallus in *Phyllospora comosa* is that

ordinarily found in the Fucaceae. The plants are monoecious. In the development of the antherid, 64 antherozoids are formed in each. The oogonial initial divides and forms a stalk and an oogonial cell. The nucleus of the oogonial cell undergoes 3 series of divisions. Of the 8 nuclei produced by these divisions, 7 disintegrate, while 1 remains unchanged. There is, therefore, but a single egg within each oogone.—*G. M. Smith.*

5483. WILSON, O. T. The holdfast of *Chaetomorpha torta*. Bot. Gaz. 78: 238-240. Fig. 1. 1924.—The living holdfast and its behavior after removal are described.—*B. W. Wells.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 5107, 5138, 5157)

5484. MALTA, N. Studien über die Laubmoosgattung *Zygodon* Hook. et Tayl. (10). [Studies on the moss genus *Zygodon*.] Latvijas Augstskolas Raksti [Acta Univ. Latviensis] 9: 111-153. Fig. 1-16. 1924.—In this, the 10th study of the series (for previous studies see Bot. Absts. 14, Entries 4450, 4451), a synopsis of the European species of *Zygodon* is given. The author recognizes the following species: *Z. Baumgartneri* Malta n. sp., based on material collected by J. Baumgartner in Styria and known from no other locality; *Z. conoideus* (Dicks.) Hook. & Tayl., Norway to Spain and the Canary Islands; *Z. Forsteri* (Dicks.) Mitt., southern England to Italy; *Z. gracilis* Wils., mountains of Central Europe; and *Z. viridissimus* (Dicks.) R. Br. widely distributed in Europe and known also from northern Africa and North America. All of these species belong to the section *Euzygodon*, except *Z. Forsteri*, which is a member of the section *Bryoides*. After distinguishing the species by means of a key the author discusses the specific characters in detail and describes the geographical distribution of each form. The most variable species is *Z. viridissimus*, which is subdivided into the subspecies *ewiridissimus* n. subsp. and *dentatus* (Breidl.), the latter based on *Z. dentalis* (Correns), based on forma *australis* typ. *occidentalis* Correns. Under the latter variety *Z. Stirtoni* Schimp. is included as f. *Stirtoni* (Schimp.). The distribution of each species (except *Z. Baumgartneri*) is represented on maps, and many morphological features of the various forms are illustrated.—*A. W. Evans.*

5485. MALTA, N. Studien über die Laubmoosgattung *Zygodon* Hook. et Tayl. (11-12). [Studies on the moss genus *Zygodon*.] Latvijas Augstskolas Raksti [Acta Univ. Latviensis] 10: 303-335. Fig. 1-18. 1924.—In the 11th study of this series (for the 10th, see preceding entry) the author gives an account of the species of *Zygodon* belonging to his section *Bryoides* (see Bot. Absts. 14, Entries 4450, 4451). These species are largely exotic, and the many difficulties involved in their interpretation are emphasized. After a characterization of the section and a statement regarding its geographical range, 6 species are distinguished by means of a key and then figured and fully discussed. These species, with their respective ranges, are the following: *Z. corralensis* Lorentz, Chile; *Z. Forsteri* (Dicks.) Mitt., Europe; *Z. gracillimus* Broth., Bolivia, Java and New Zealand; *Z. Menziesii* (Schwaegr.) W.-Arn., Australia, New Zealand and Tasmania (with the n. var. *angustifolius* of New Zealand); *Z. minutus* C. M. & Hampe, Australia, New Zealand and Tasmania; and *Z. pungens* C. M., Brazil, Guatemala and Venezuela. In the "species-group" of *Z. pungens* the following incompletely known species are included: *Z. humilis* Thw. & Mitt., Ceylon; *Z. microtheca* Dixon n. sp., East Africa; and *Z. parvulus* Gehceb & Hampe, Brazil. A species from Chile, heretofore confused with *Z. Menziesii* but belonging to the section *Stenomitrium*, is described and figured under the name *Z. bartramioides* (Dusén) n. comb. (based on *Pentastichella bartramioides* Dusén ms.). The following reductions to synonymy may likewise be noted: *Bryum oamaruense* R. Brown and *Z. Drummondii* Tayl., included under *Z. Menziesii*; *Z. mucronatus* Broth., under *Z. minutus*; and *Z. inconspicuus* Herzog, under *Z. gracillimus*.—In the 12th study the section *Obtusifolii* is treated, the only species recognized being *Z. obtusifolius* Hook., originally described from Nepal. The following species, however, are given as synonyms: *Z. Araucariae* C. M., Brazil, *Z. erythrocarpus* C. M., Argentina,

Z. linguaeformis Hampe, Colombia, *Z. linguiformis* C. M., Venezuela and Bolivia, *Z. neglectus* Hampe, New Zealand, *Z. rufulus* Dusen ms., Chile (see Bot. Absts. 14, Entry 4450); and *Z. spathulifolius* Besch., Mexico. The species is fully described and figured and the vars. *antarcticus* and *latifolius* are proposed as new.—A. W. Evans.

5486. Мейер, К. И. [MEYER, K. I.] История развития спорогония у *Radula complanata* (L.) Dumortier. Материалы для познания спорофита Jungermanniales. I. [Development of the sporogonium of *Radula complanata*. Contributions to our knowledge of the sporophyte in the Jungermanniales. I.] Журн. Русск. Ботан. Общ. [Jour. Russian Bot. Soc.] 5: 1-8. Pl. 1. 1920.—The fertilized egg in *Radula complanata* divides by a horizontal wall into a hypobasal cell, which remains undivided and forms an appendage to the foot, and an epibasal cell, from which the rest of the sporophyte is developed. In the epibasal cell a horizontal wall is followed by 2 vertical walls at right angles, giving rise to an octant condition. Additional horizontal walls then arise, followed by periclinal walls which, in the upper part, separate the primary wall-cells from the sporogenous tissue. At maturity the wall consists of 2 layers. The sporogenous tissue soon shows the usual differentiation into elaters and spore mother cells, the latter assuming a quadrilobar form prior to the reducing division. The cells of the pedicel are characterized by their translucent appearance and by their regular arrangement in longitudinal rows. (From a French résumé accompanying the paper.)—A. W. Evans.

5487. Савич, В. П., и Л. И. Савнч. [SAVICH, V. P., AND L. J. SAVICH.] Краткий предварительный отчет об исследовании флоры мхов и шайников илишайников Белоруссии летом 1923 г. [Short preliminary report on the investigation of the moss and lichen flora of White Russia during the summer of 1923.] (Russian, with German résumé.) Всписки Белорусского Госуд. Инстит. Сельск. Хозяйства [Mem. Inst. Etat Agron. Belarussie (Minsk).] 3: 57-72. 1924.—The collections made by the authors in White Russia, during the summer of 1923, included 200 species of mosses, 150 of lichens and 50 of fungi, together with about 80 species of spermatophytes associated with them. Especial attention was devoted to the Komarow Bog near Minsk, where the effects of agriculture on the original flora were investigated. Another bog in the vicinity of Minsk and 2 wooded regions in the Tsherwensky district, where the forests are almost virgin in character, were likewise studied, and various types of associations were distinguished. In these forests the lichen, *Byssoloma tricholomum* (Mont.) A. Zahlbr., hitherto unknown in European Russia, was found to be widely distributed.—A. W. Evans.

5488. SØRENSEN, S. Eidsvoll løvmosflora. (Iagttagelser over løvmosernes utbredelse i Eidsvoll i femaaret 1909-1914.) [The moss-flora of Eidsvoll. (Observations on the distribution of mosses in Eidsvoll in the quinquennium 1909-1914.)] Nyt Mag. Naturvidensk. [Kristiania] 58: 1-27. 1 fig. 1920.—The Eidsvoll District in central Norway was investigated by the author during the years 1909-1914. A brief description of the natural conditions in the district is given, together with a systematic list of all the mosses found. *Pohlia lutescens* is new to the flora of Norway.—K. Münster Strøm.

5489. WETTSTEIN, FRITZ VON. Splachnaceenstudien. I. Entomophilie und Spaltöffnungsapparat. [Studies on the Splachnaceae I. Entomophily and the stomatal apparatus.] Oesterreich. Bot. Zeitschr. 70: 65-77. 1 pl., 1 fig. 1921.—The genera *Splachnum* and *Tetraplodon* will grow only on substrata rich in organic matter. They are usually found on dung. Insects are the most important agents in carrying the spores to appropriate places. They are attracted by the enlarged apophysis, which is brightly colored in some species. The insects, however, do not depend entirely on sight since flies come to the plants in a dark room, attracted by a carrion odor given off by the apophysis. As the plants mature the stomata become enlarged and cease to function. The chloroplasts also degenerate. Species which have the greatest enlargement of the apophysis have the greatest proportion of these non-functioning stomata. These facts show that this enlargement is a device to attract insects and is not primarily a photosynthetic organ. The substance causing the odor has not been definitely identified but seems to belong to the indol group.—T. D. Howe.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*
J. E. FLYNN, *Assistant Editor*

(See also in this issue Entries 5083, 5094, 5107, 5118, 5121, 5157, 5164, 5170, 5266, 5487, 5571, 5572, 5577, 5584, 5602, 5620, 5628, 5703, 5877, 5829, 5846, 5870, 5872)

FUNGI

5490. BEARDSLEE, H. C. Notes on the scaly species of Hydnaceae. *Mycologia* 16: 255-258. *Pl.* 20. 1924.—*Sarcodon imbricatus* was found to be scaly at first, but the scales soon disappeared, and after about 3 weeks the plants had become infundibuliform, with longer and coarser teeth than formerly. *S. laevigatus* may be merely this older form of *S. imbricatus*. *S. fennicus* is smooth at first, later becoming scaly. *S. Underwoodii* may be a young stage of *S. fennicus*. *S. fuligineo-violaceus* is noted from specimens found in Florida.—G. R. Bisby.

5491. BOSE, S. R. Polyporaceae of Bengal. Part VII. Proc. Sci. Convention Indian Assoc. Cultivation Sci. 1920-1921: 27-36. 1923.—Full descriptions and geographical distribution are given for 13 species representing the genera *Trametes*, *Fomes*, *Daedalea*, and *Hexagonia*. Plates illustrating both surfaces of the fruit-body in each species are provided. One species, *Daedalea boscii*, is described as new.—S. R. Bose.

5492. Бургвиц, Г. К. [Burgwitz, G. K.] Новый вид дрожжей *Saccharomyces betae* n. sp., выделенный из закатанной свеклы. [New species of yeast, *Saccharomyces betae* n. sp., isolated from beet pulp.] Ботанические Материалы Института Спорных Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 43-46. 1924.—*Saccharomyces betae* Burgowitz, a new species of yeast from beets, is described.—Frederick V. Rand.

5493. BURT, E. A. The Thelephoraceae of North America. XIII. *Cladoderris*, *Hypolyssus*, *Cymatella*, *Skepperia*, *Cytidia*, *Solenia*, *Matruchotia*, *Microstroma*, *Protocoronospora*, and *Asterostroma*. Ann. Missouri Bot. Gard. 11: 1-36. *Pl.* 1. 1924.—In this monographic consideration of these genera the included species are as follows: *Cladoderris dendritica* Pers., *C. floridana* Lloyd, *Hypolyssus Montagnei* Berk., *Cymatella minima* Pat., *C. pulverulenta* (B. & C.) Pat., *C. marasmioides* (B. & C.) Pat., *Skepperia spathularia* (B. & C.) Pat., *Cytidia flocculenta* (Fr.) v. Höhn & Litsch., *C. salicina* (Fries) Burt. n. comb. (syn. *Thelephora salicina* Fr.), *C. tremellosa* Lloyd, *Solenia Candida* Pers., *S. fasciculata* Pers., *S. polyphoroidea* Peck, Mss. n. sp. (syn. *S. villosa* Fr. var. *polyporoidea* Peck), *S. conferta* Burt. n. sp., *S. filicina* Peck, *S. sulphurea* Sacc. & Ellis, *S. anomala* (Pers.) Fuckel, *S. cinerea* Burt, *S. poriaeformis* (Pers.) Fr., *S. subporiaeformis* Burt, n. sp., *S. endophila* (Ces.) Fr., *Asterostroma cervicolor* (B. & C.) Massee, *A. muscicolum* (B. & C.) Massee, *A. bicolor* E. & E., *A. spiniferum* Burt, n. sp., *A. gracile* Burt, n. sp., and *A. ochrostroma* Burt, n. sp.—*Solenia gracilis* Copeland and *S. villosa* Fries are listed as "species imperfectly known" although American mycologists have referred collections to the latter, which is imperfectly known in its own country.—Burt regards *Matruchotia* as a genus of the *Stilbaceae* while Maire's conclusion that *Microstroma* is one of the *Melanconieae*, is cited. Burt also agrees with Wolf's opinion that *Protocoronospora* belongs to the *Melanconieae*.—S. M. Zeller.

5494. BURT, E. A. Some wood-destroying fungi of Java. Ann. Missouri Bot. Gard. 11: 37-42. *Pl.* 2. 1924.—A list of 17 species of Javan wood-inhabiting fungi based on collections by Carl Hartley includes 3 new species: *Hydnum obrutans*, *Stereum obscurans* and *Protomerulius javensis*, described by Burt.—S. M. Zeller.

5495. CASTELLARNAU, JOAQUIN MARIA. Estudio sistematico de los Hifales de la Flora espanola, conocidos hasta la fecha. [Systematic study of the known Hyphomycetes of the Spanish flora.] Revista R. Acad. Cien. Exactas, Fisicas y Nat. [Madrid] 21: 245-248. 1924.—This apparently is a preliminary announcement and review of a systematic study of the Hyphomycetes of Spain made by ROMUALDO GONZALEZ FRAGOSO.—L. L. Harter.

5496. FOEX, E. Notes sur les Erysiphées. [Notes on the Erysiphaceae.] Bull. Trimest. Soc. Mycol. France 40: 236-244. Pl. 14-17, fig. 1-4. 1924.—The conidiophore of *Erysiphe Polygoni* originates from a branching mycelium, and differentiates a lower mother cell and an upper conidium; the conidiophore contains 6-8 cells in *E. cichoracearum*; while that of the *Oidium* on *Cucurbita pepo* bears 7-8 cells on a mother cell supported by a big basal cell.—J. Dufrenoy.

5497. GOLDING, N. S. The mold associated with the ripening of blue veined cheese. Mycologia 17: 19-32. Pl. 2. 1925.—The *Penicillium* associated with Wensleydale cheese was found to differ from *P. roqueforti* in the following respects: it does not produce the white areas of closely interwoven hyphae which *P. roqueforti* produces on agar; it produces a slight acidity on whey-peptone-litmus-gelatin, and *P. roqueforti* does not; it digests casein of milk only about $\frac{1}{4}$ as rapidly as does *P. roqueforti*; it grows less freely on a synthetic medium containing saccharose, galactose, levulose, or dextrose, but more freely on a medium containing casein or peptone, than does *P. roqueforti*. Whether the 2 molds should be considered as different species, or as varieties only, has not been decided. Neither fungus will grow at blood heat, and for both the optimum temperature was found to be between 20.6 and 28.9°C. The minimum temperature for growth is below 4.5°C.—G. R. Bisby.

5498. JANKE, ALEXANDER. Allgemeine technische Mikrobiologie. I Teil: Die Mikroorganismen. [General technical microbiology. Part I: Microorganisms.] (In: RASSOW, B. Fortschritte der Chem. Technologie in Einzeldarstellungen. Bd. 4.) xii + 342. p. 1 pl., fig. 1-10. Theodor Steinkopff: Dresden & Leipzig, 1924.—Part I of this volume takes up the morphology and taxonomy of microbes, including the bacteria and fungi. Under each group are discussed outer cell form, reproduction, cytology and other characteristics of the cells, and taxonomy.—The 2nd part deals somewhat more briefly with other groups of microorganisms, including the algae, lichens, myxomycetes, protozoa, and ultramicroscopic organisms.—The text is followed by lists of abbreviations of names of authorities and of scientific journals, and author and subject indexes.—Frederick V. Rand.

5499. JONES, S. G. The life-history and cytology of *Rhytisma acerinum*. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 487. [1924].

5500. KILLIAN, C. Le développement du *Graphiola Phoenicis* Poit. et ses affinités. [The development of *Graphiola Phoenicis* Poit. and its affinities.] Rev. Gén. Bot. 36: 385-394, 451-459. 1924.—The plectenchyma of *Graphiola Phoenicis*, having broken the foliar epidermis of the date-tree, evolves a hemispheric tissue in which are differentiated an external membrane, an internal membrane and central plectenchyma, all 3 formed of uninucleated cells, apparently in the haplophase.—The uninucleated cells at the base of the central plectenchyma engender a growth tissue made up of elongated cells, containing many dicaryons; these latter become enclosed in cells with a single dicaryon in each and are transformed into a layer of dicaryons, apparently in the dicaryophase.—The dicaryophase closes the constitutive period and represents the beginning of the diplophase which characterizes the period of maturation; it ends by the fusion of the dicaryons when each diplocaryon constitutes the spore. Then they redivide and each of the nuclei migrates into a budding sporidium on the surface of the spore. By the accumulation of sporidia and growth of the internal membrane they break out of the sporiferous cavity which opens, usually above.—By the morphology of its carpophore, *Graphiola* is related to the more highly developed Ustilaginales, possessing all the essential cytological characters of the filamentous Ustilaginales. By the same characters it approaches the primitive Uredinales such as *Coleosporium* and the simplified Uredinales such as *Endophyllum*, and through the latter the higher Uredinales. The Ustilaginales of which *Graphiola Phoenicis* is an apogamous representative, form a continuous series, uniting by all the stages of transition the Basidiomycetes (perittogams) which are related to the Uredinales (isogams) and to the Ascomycetes (iso- and heterogams). *Graphiola* recalls the hypothetical archetype, common to these groups.—J. C. Gilman.

5501. KITASIMA, KIMIZO. Morphologie und Systematische Stellung des orangefarbenen Pilzes, welcher bald nach dem am 1. September 1923 in Tokyo stattgefundenen Feuer entwickelt ist. [Morphology and systematic position of the orange colored fungi which developed soon after the Tokyo fire of Sept. 1, 1923.] (Japanese.) Zeitschr. Forstwiss. Ges. Japan 21:

285-291. 2 fig. 1924.—The fungus was *Monilia aurea* Gmel. The author has often observed perithecia associated with this fungus in nature, attached to the bark of trees, etc., and has repeatedly obtained pure cultures of the fungus from the ascospores, and was able thereby to obtain the characteristic orange-colored conidia. The perithecia are pyriform and black, the asci are clavate and contain 8 ascospores. In the author's opinion the organism must be referred to the Sphaeriales, and to the genus *Anthostomella*. On the basis of the results given above the author reaches the conclusion that in this case *Monilia* constitutes a conidial generation of *Anthostomella* and is no longer to be considered as invariably a conidial form of *Sclerotinia*, as appeared hitherto.—Author. (Courtesy Japanese Jour. Bot.)

5502. LEBEDEVA, L. A. Fungi novi e Sibiria polari. [New fungi from northern Siberia.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Nectulae Systematical Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 15-16. 1924.—Latin diagnoses are given of the following new species: *Lophiostoma Birulae* Lebed., *Naucoria arctica* Lebed., and *Clitocybe Karsteniana* Lebed.—Frederick V. Rand.

5503. Лебедева, Л. А. [Lebedeva, L. A.] Новые хозяева растения-грибка *Eocronartium typhuloides* Atkinson. [Note on *Eocronartium typhuloides* Atkinson.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Nectulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 47-48. 1924.

5504. LINGELSHIM, ALEXANDER. Ein neues, hexenringartig wachsendes *Cephalosporium*. [A new species of *Cephalosporium* which forms "fairy rings."] Oesterreich. Bot. Zeitschr. 70: 91-95. 1 fig. 1921.—A new fungus, related to *Cephalosporium charticola*, is described as *C. herpetiforme*; it was found on the sandstone wall in the greenhouse and only occurs where algae are growing. When the colonies reach a diameter of about 1 cm. the center begins to die and as growth continues a ring is formed. If 2 rings meet, the parts of both die where they touch, forming irregular masses. This is compared with the rings of *Trichophyton tonsurans* and those of mushrooms.—T. D. Howe.

5505. McDONGALL, W. B. A new mushroom. Trans. Illinois State Acad. Sci. 17: 84. Pl. 91. 1924 [1925].—A new species of *Marasmius* was found in the University of Illinois woods near Urbana. It was usually found attached to buried nuts of the previous season. The nut shell rather than the meat seems to be the substratum to which the mushroom is attached. The new species is described under the name, *Marasmius nucicola*.—H. W. Anderson.

5506. McLENNAN, ETHEL, AND ISABEL COOKSON. Additions to the Australian Ascomycetes. No. I. Proc. Roy. Soc. Victoria N.S. 35: 153-158. 2 pl., 1 fig. 1923.—The following new Victorian Ascomycetes are described in Latin and discussed as part of a record to be continued. *Sphaerosoma alveolatum* n. sp. (fig.), *Lamprospora areolata* Seaver var. *australis* n. var. (fig.), *L. tuberculata* Seaver (new record) and *Cordyceps furcata* n. sp. (fig.).—Eloise Gerry.

5507. MAINS, E. B., AND H. S. JACKSON. Aecial stages of the leaf rusts of rye, *Puccinia dispersa* Erikss. and Henn., and of barley, *P. anomala* Rostr., in the United States. Jour. Agric. Res. 28: 1119-1126. Pl. 1. 1924.—As the result of studies in the greenhouse, aecia were produced upon *Anchusa officinalis* with 5 out of 15 collections of telia of the leaf rust of rye, *Puccinia dispersa*. In the field at LaFayette, Indiana, *Anchusa officinalis* was heavily rusted in the autumn of 1922 when mulched with rusted rye straw. Other Boraginaceous species, *Nonnea lutea*, *Cerinthe minor*, *C. major*, *C. alpina*, *Lappula echinata*, *Myosotis palustris*, *M. arvensis*, *M. alpestris*, *M. virginica*, *Symphytum asperum* and *Pulmonaria officinalis*, treated in a similar way were not infected. Upon *Nonnea rosea* a few pycnia developed. This agrees with the results obtained by Eriksson in Sweden. A new host for the aecial stage of this rust was discovered in *Anchusa capensis*, which was found naturally infected. It was found that the teliospores of *Puccinia dispersa* not only germinate in the autumn, but may retain their viability over winter and germinate the following spring. The aecial stage of *Puccinia dispersa* apparently does not play an important part in the distribution and spread of this rust in the U. S. A. The leaf rust of barley, *Puccinia anomala*, obtained from 4 widely separated localities in the U. S. A. produced aecia upon Star-of-Bethlehem, *Ornithogalum umbellatum*, both in the greenhouse and the field at LaFayette, Indiana, in the spring of 1922 and again in 1923. This agrees with the results obtained by Tranzschel in Russia. *Puccinia anomala* in its host specialization is distinct from the closely related rust, *Uromyces Hordei*,

neither one infecting the hosts of the other. Since Star-of-Bethlehem possesses weed-like characteristics in the U. S. A., it is considered a dangerous plant near barley fields.—*E. B. Mains*.

5508. MONTPELLIER, J. *Deuxième cas algérien de mycétome du pied* (type "pied de Madura"), dû à l'*Aleurisma apiospermum*. [Second Algerian case of mycosis of the foot due to *A. apiospermum*.] Bull. Soc. Path. Exotique 17: 755-757. 1924.—The fungus, *Scedosporium apiospermum* Sacc., is briefly described as it occurs in the human foot, and some characteristics of its growth in culture are given. The disease is very rare.—*Philip Brierley*.

5509. MURRILL, W. A. *Botanizing in Virginia*. Mycologia 17: 44. 1925.—This is a popular account.—*G. R. Bisby*.

5510. NISHIMURA, MAKOTO. *Studies in Plasmopara Halstedii*. Jour. Coll. Agric. Hokkaido Imp. Univ. 11: 185-210. 6 pl., 7 fig. 1922.—The author writes on *Plasmopara Halstedii*, paying special attention to the following: (1) Infection of *Helianthus annuus* L. by the zoospores of this species; (2) the mode of fertilization in this fungus. Concerning (1) he mentions a new type of root infection for the Peronosporaceæ, which is found in *P. Halstedii*. Under (2) he deals in detail with its fertilization, pointing out especially that a manocyst (receptive papilla) is formed during the nuclear division of the oosphere, and that this manocyst protrudes into the antheridial cell; this afterwards retracts and conducts a fertilizing tube from the antheridium into the center of the oosphere, etc.—*Author*. (Courtesy Japanese Jour. Bot.)

5511. NISIKADO, YOSIKAZU. *Effect of temperature on the growth of Helminthosporium Oryzae* Br. D. Haan. (Japanese.) Ann. Phytopath. Soc. I. 5: 20-30. 1923.—The present paper deals with the thermal effect on the germination of the conidia, the growth of the mycelium and the formation of the conidia of *Helminthosporium Oryzae*, and also the thermal death point. The optimum temperature for the germination of the conidia lies between 25 and 30°C., at which temperature 70% or more of the conidia germinate. The minimum temperature for germination is 2°C. The germ tubes produced at this temperature are spherical or elliptical and swell up pronouncedly; they are never linear, as are those of normal shape. The maximum temperature for germination is 41°C.; here the germ tubes are also spherical or elliptical, but smaller than those formed at 2°C. The best growth of the mycelium was secured at a temperature between 27 and 30°C. The maximum temperature for the formation of the conidia is between 35 and 38°C.; the minimum temperature, 5°C. Conidia formed at the optimum temperature are obclavate and curve to 1 side; those formed at 5°C. are cylindrical and straight and have a smaller number of the septa; and those at 30°C. are shorter and wider than those formed at 20°C. Conidia formed at lower temperature are dark in color, but become lighter with rise of temperature. The thermal death point (under 10 minutes exposure) for the conidia is 50-51°C.; and for the germinated conidia on hyphæ, 48-50°C.—*Author*. (Courtesy Japanese Jour. Bot.)

5512. OSBORN, T. G. B., AND G. SAMUEL. *Some new records of fungi for South Australia. Part 2: Together with a description of a new species of Puccinia*. Trans. and Proc. Roy. Soc. South Australia 46: 166-180. Pl. 7, fig. 1-4. 1922.—This paper adds 51 species to the fungus flora of the State and 9 names to the list of host-species. Special notes are given regarding: *Uromyces bulbinus* Thuem., *Uromycladium Tepperianum* (Sacc.) McAlp., *Puccinia semibarbatæ* n. sp., *P. operculariæ* (Morr.) Syd., *Ustilago Tepperi* Ludw., *Aureobasidium vitis* var. *album* Montm., *Darlucia filum* Cast., and *Plasmopara viticola* (B. & C.) B. & deT.—*Wm Randolph Taylor*.

5513. OUDEMANS, C. A. J. A. *Enumeratio Systematica Fungorum*. Vol. 5^{i-vii}: 1-999. Martinus Nijhoff: The Hague, 1924.—With the appearance of volume 5 this extensive and very important work is now complete. The publication as a whole constitutes a host index to the fungi of Europe, the word "host" being used in a broad sense to include many cases in which parasitism is not even suspected. In volume 1, hosts belonging to all the lower groups of plant life up to and including the Monocotyledons are given. In volumes 2-4 inclusive the Dicotyledons are covered. The 5th and final volume is a general index to the preceding volumes. In it all names of fungi and hosts, including synonyms in both cases, are enumerated. It constitutes the key to the whole work and by its use the host range of any given fungus may be determined.—*H. Fitzpatrick*.

5514. SAITO, KENDO. Beschreibung von zwei neuen Hefearten, nebst Bemerkungen über die Sporenbildung bei *Torulaspora Delbrücki*, Lindner. [Descriptions of two new species of yeasts with remarks on spore formation in *Torulaspora Delbrücki* Lindner.] Bot. Mag. Tôkyô 37: 63-66. 1923.—Technical diagnoses of *Zygosaccharomyces mongolicus* n. sp. and *Torulaspora fermentati* n. sp. are given. A method of inducing sporulation in *T. Delbrücki* is described.—H. Fitzpatrick. (From author's abstract. Courtesy Japanese Jour. Bot.)

5515. SAWADA, KANEYOSHI. Materials for the mycological study in Formosa. No. 24. (Japanese.) Trans. Nat. Hist. Soc. Formosa 62: 77-84. 1922.—The following are discussed: *Albugo Ipomaeae-aquaticae* n. sp., on *Ipomaea aquatica*. *Pseudoplasmodium* n. gen. with mycelium running through the intercellular spaces of the host and provided with ovate haustoria; conidiophores protruding through stomata, several times di- or trichotomously branching; branching right-angled or nearly so; terminal branchlets truncate and tufted, each with a conidium at its apex; conidia ovate and producing a germtube; no oospores yet seen; conidiophores and conidia entirely similar to those of *Plasmopara* but distinguished by the production of germtubes instead of swarmspores in germination. *Pseudoplasmodium Justiciae* n. sp., on *Justicia procumbens*; *Protomyces Lactucae* n. sp., on *Lactuca* sp.; *Kordyana Commeliniae* n. sp., on *Commelina nudiflora*.—Author. (Courtesy Japanese Jour. Bot.)

5516. SEAVER, FRED J. The fungous flora of St. Croix. Mycologia 17: 1-18. Pl. 1. 1925.—The author lists the fungi of the Island of St. Croix, of the American Virgin Islands. He describes *Glonium clavisporum* and *Phyllachora Rickseckeri* Ellis & Kels. (in herb.) as new species. The latter occurs on *Cissampelos Pareira*. The collecting trip of 1 week yielded 58 other fungi not previously reported for the island, and 67 other fungi are noted as having been previously recorded there; 10 of these were re-collected. The 127 fungi include 5 Phycomycetes, 45 Ascomycetes, 10 Imperfect Fungi, 2 smuts, 31 rusts, and 34 other Basidiomycetes. The rare *Tomophagus Colossus* was found.—G. R. Bisby.

5517. TAKAHASHI, TEIZO, MATAO YUKAWA, JUNSHIRO OKUMURA, KAMAJIRO EDA, AND TAKEHARU YAMAMOTO. Studies on the varieties of sake yeast, *Saccharomyces Saké* (Kozai) Yabe. Jour. Agric. Coll. Imp. Univ. Tokyo 7: 81-118. 6 pl. 1922.—Yeasts obtained from various factories in Japan were isolated and purified. Their slant cultures in koji-extract agar were examined after 15 months and their characteristics studied. With rare exceptions, scarcely any difference may be found between the form of the varieties of saké yeast in common culture, but in old culture we may recognize change of shape, club-shape, citron- or pear-shape, or irregular form. Spore-formation takes place in all varieties examined except 2; optimum-temperature is 30°, and 16-20 or 40 hours are required for sporulation. Spores are round or elliptic, 2.5-4 μ in diameter, 1-4 in each ascus. No film formation was observed at 40° but it takes place at 15-35°, according to different varieties. Giant colonies are formed and according to their form saké yeast may be classified into 9 types. The general results concerning their behavior towards sugar are in accordance with those of other authors, but there are some exceptions. Some varieties ferment mannose very feebly, some are not able to ferment galactose, while others ferment it very energetically. Almost half the number of varieties are unable to ferment α -methyl-glucoside and 2 varieties were found to be unable to ferment raffinose. The authors have observed the fact that some varieties which ferment saccharose owing to their invertin are able to ferment raffinose very feebly; this proves that raffinase is a special enzyme. A kind of *Torula* was observed that ferments raffinose and galactose but not saccharose, melibiose and fructose, perhaps owing to the presence of emulsin which gives rise to galactose from raffinose. The fermenting energy studied after the method of Meissl was found to vary from 50 to 70, and very rarely to be under 50. The real coefficient of fermentation generally lies between 50 and 60, rarely 70 or below 50. In general, the quantity of acids formed is 0.06-0.09%, but rarely 0.13% or below 0.04%. The quantity of alcohol formed under the same conditions was 2-4 vol. %, the highest coefficient of assimilation of amino-acids is 83.—Authors. (Courtesy Japanese Jour. Bot.)

5518. TAKAHASHI, TEIZO, AND YONESABURO SANO. On the budding fungi of "Shôyumoromi." Jour. Agric. Coll. Imp. Univ. Tokyo 7: 119-155. 1 pl. 1922.—The authors have studied 70 samples of Shôyumoromi derived from various factories in 3 ripening stages (young, medium, old) and found the following new budding fungi: (1) Film-forming *Zygosac-*

charomyces; *Z. salsus* var. *saccharosum* I and II; (2) non film-forming *Zygosaccharomyces*, *Z. Soja* var. *saccharo-raffinoseum*; (3) asporogenic *Zygosaccharomyces*; (4) *Torula*, (a) *Torula* No. 1; (b) non film-forming varieties; *Torula* II-VIII; (5) red yeast, No. 1-3; (6) *Willia*, 2 varieties; (7) *Mycoderma*; (8) *Saccharomyces*; (9) *Oidium* and *Sachsia*.—The size, form, spore-formation, products of fermentation, behavior towards various chemical substances, etc., are given for each fungus.—Authors. (Courtesy Japanese Jour. Bot.)

5519. TOGASHI, KOGO. Comparative studies on cultural characters of the three species of *Valsa*. (Japanese.) Jour. Soc. Agric. Forest. Sapporo 15: 29-38. 1923.—The 3 species used in the experiment are *V. Mali* Miyabe & Yamada isolated from *Malus communis*, *Cytospora chrysosperma* (Pers.) Fr. from *Populus nigra* and *V. ambiens* Fr. from *Morus bombycis*. These fungi were inoculated on hard agar media of corn meal, oat meal and apricot-juice containing M/2 and M/26 of cane sugar and glucose respectively. The essential data may be summarized as follows: (1) Among these fungi, *C. chrysosperma* grew most vigorously on any cultural medium and produced pycnidia most abundantly. These facts show that this species has the power to utilize the sugars more than the others.—(2) *V. Mali* and *C. chrysosperma* had their maximum-points of hyphal growth and pycnidial formation on the corn meal and oat meal media which contain comparatively high concentrations of sugars. *V. ambiens* on the corn meal media had the maximum point of hyphal growth and pycnidial production at the highest concentrations of sugars, while in the case of oat meal media it has 2 maximum points, at the highest and lowest concentration of sugars.—(3) These fungi showed no differences in cultural characters on apricot media, though various amounts of sugars were added. *V. ambiens* could not grow on such a highly acid medium as apricot-juice, even if much sugar was added.—(4) In the first part of the cultural experiment, *V. ambiens* changed the media of corn meal and oat meal containing sugars to a brilliant purple color; this character was not found in the case of the other fungi.—(5) The 3 fungi used in the experiment had not produced perithecia on any medium 3 months after inoculation.—Author. (Courtesy Japanese Jour. Bot.)

5520. Воронихин, Н. Н. [VORONIKHIN, N. N.] Новые виды грибов с Кавказа II. [New species of fungi from the Caucasus II.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 33-34. 1923.—Latin diagnoses are given of the following new species: *Phyllosticta Ostryae*, *P. Saxifragae-cordifoliae*, *P. Peucedani*, *P. Gentianae*, and *P. Tussilaginis*. Voronikhin is the authority for each.—Frederick V. Rand.

5521. Воронихин, Н. Н. [VORONIKHIN, N. N.] Новые виды грибов с Кавказа III. [New species of fungi from the Caucasus III.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Reipubl. Rossicae] 3: 31-32. 1924.—Latin diagnoses of the following fungi are given, Voronikhin being the authority: *Melanospora endobiotica* n. sp., *Ascochyta Arachidis* n. sp., *A. Astragali* Lebed. f. *foliicola* n. f., *A. Boehmeriae* n. sp., *A. Urticae* n. sp., and *Isariopsis Mespili* n. sp.—Frederick V. Rand.

5522. YASUDA, ATSUSHI. Zwei neue Arten von *Polystictus*. [Two new species of *Polystictus*.] Bot. Mag. Tôkyô 36: 154-157. 3 fig. 1922.—*Polystictus gypscus* and *P. orientalis* are described and figured.—S. Ikeno. (Courtesy Japanese Jour. Bot.)

5523. YASUDA, ATSUSHI. Neue Arten von *Stereum* und *Hymenochaete*. [New species of *Stereum* and *Hymenochaete*.] Bot. Mag. Tôkyô 37: 60-61. 2 fig. 1923.—*Stereum japonicum* and *Hymenochaete boninensis* are described and figured.—S. Ikeno. (Courtesy Japanese Jour. Bot.)

5524. YASUDA, ATSUSHI. Eine neue Art von *Hypoxylon*. [A new species of *Hypoxylon*.] Bot. Mag. Tôkyô 37: 67-68. 1 fig. 1923.—*Hypoxylon viride* is described and figured.—S. Ikeno. (Courtesy Japanese Jour. Bot.)

5525. YASUDA, ATSUSHI. Zwei neue Arten von *Trametes*. [Two new species of *Trametes*.] Bot. Mag. Tôkyô 37: 83-85. 3 fig. 1923.—*Trametes sendaiensis* and *T. symloci* are described and figured.—S. Ikeno. (Courtesy Japanese Jour. Bot.)

5526. YASUDA, ATSUSHI. Vier neue Arten der Basidiomyceten. [Four new species of Basidiomycetes.] Bot. Mag. Tôkyô 37: 125-130. 5 fig. 1923.—*Stereum roseum*, *Polyporus (Amaprodermus) sendaiensis*, *Daedalea Dickinsonii* and *Lycoperdon bispinosum* are described and figured.—S. Ikeno. (Courtesy Japanese Jour. Bot.)

5527. ZELLER, S. M. *Coryneum Ruborum* Oud. and its ascogenous stage. *Mycologia* 17: 33-41. Pl. 3, fig. 1. 1925.—Red and black raspberries in Oregon were found commonly bearing *Coryneum Ruborum*. The lesions which bear the fungus are briefly described. The spores withstand desiccation at room temperature for at least 2 years. An Ascospore was found on old canes. Cultures from ascospores yielded the *Coryneum* stage. The fungus is described as *Ascospora Ruborum* (Oud.) Zeller, n. comb.—In water the ascus wall remains firm, except the apical portion which gelatinizes while an inner sheath elongates and finally breaks, whereupon the spores are forcibly ejected.—G. R. Bisby.

LICHENS

5528. MALME, GUST. O. Die Flechten der ersten Regnellischen Expedition. *Astrotheliaceae, Paratheliaceae und Trypetheliaceae*. [Lichens of the first Regnellian expedition. *Astrotheliaceae, Paratheliaceae and Trypetheliaceae*.] *Arkiv. Bot.* 19²: 1-34. 1924.—The above named families are almost entirely tropical. The species here dealt with were gathered in Brazil and Paraguay. The author gathered only 2 members of *Astrotheliaceae* and 2 of *Trypetheliaceae* in Rio Grande do Sul (extratropical); 4 of *Astrotheliaceae*, 2 of *Paratheliaceae* and 8 of *Trypetheliaceae* in Paraguay; 10 of *Astrotheliaceae*, 6 of *Paratheliaceae* and 12 of *Trypetheliaceae* in Matto Grosso. The following are new: *Pyrenastrum cubanum* (Nyl. russ.) Müll. Arg. var. *intermedium* and var. *obtectum*, *P. microsporum*, *P. fulvum*, *P. personatum*, *P. depauperatum*, *Astrothelium croceum*, *A. nigricans*, *A. punctulatum*, *A. ocellatum*, *A. acroleucum*, *Lithothelium violascens*, *Parathelium fusisporum*, *P. subferrugineum* and f. *expallescentis*, *P. cuyabense*, *P. dilutum* and var. *catervarium*, *P. crassiusculum* and f. *Chlorophorae*, *Laurera sanguinaria*, *L. madreporiformis* (Eschw.) Riddle ap. Howe f. *pruinosa*, *L. chapadensis*, *L. ambigua*, *Trypethelium, eluteriae* Spreng. var. *polystomum*, *T. Regnelli*, *T. platystomum* Mont. var. *denudatum*, *T. subcatervarium*, *T. brachysporum*, *Melenotheca anomala* (*Trypethelium anomala* Ach.), *M. Arthonioides* var. *Lucheae* and var. *Machaerii*, and *Tomasellia paraguayensis*.—O. Heilborn.

5529. MALME, GUST. O. En ny fyndort i Västergötland för *Cetraria normoerica* (Gunn.) Lyng. [A new locality for *Cetraria normoerica* (Gunn.) Lyng. in Västergötland (prov. in Sweden).] *Svensk Bot. Tidskr.* 18: 548-549. 1924.—A new locality for this species is reported from the province of Västergötland.—O. Heilborn.

5530. WARÉN, HARRY. Beobachtungen bei Kultur von Flechtenhyphen. [Observations on the culture of hyphae of lichens.] *Ofersigt Finska Vetensk.—Soc. Forhandl. A.* 62¹⁰: (1-9). 1 pl. 1919-1920.—The hyphae of *Phycia ciliaris* were isolated and studied in pure culture. After 3 months they contained a diffuse, golden yellow, chlorophyll-like coloring matter in the protoplasm.—R. Collander.

BACTERIA

5531. ANONYMOUS. A study of the pollution and natural purification of the Ohio River. Part II. Report on surveys and laboratory studies. *Public Health Bull.* 143. 1-343. U. S. Public Health Service. 1924.—Under the heading of bacteriological studies are considered: (a) the extent and sources of bacterial pollution of the river and (b) the extent and rates of its natural purification. Under (a) are discussed: (1) the pollution of the river in zones from which water supplies are taken; (2) the bacteriological quality of filtered water supplies; (3) the pollution of the river in zones immediately below large cities; (4) the numbers of bacteria added in city wastes; (5) the influence of large tributaries on the pollution of the Ohio River, and (6) the changes in bacterial content of the river between successive sampling stations. Under (b) it is shown that the river undergoes a marked bacterial self-purification, the rate of which is an orderly function of time modified by seasonal influences and, in its observable effects by the disturbing effects of inflow. The relation between the time factor and progressive bacterial reduction in the river is shown by empirical formulae derived from curves fitted to observations made in the 130-mile stretch between Cincinnati and Louisville. Results of calculations by means of these formulae are shown to agree reasonably well with those of observation.—H. W. Streeter. (*Public Health Engineering Absts.*)

5532. AYERS, S. HENRY, AND WM. T. JOHNSON, JR. Studies on pasteurization. XII. Cause and significance of pin-point colonies from pasteurized milk. Jour. Bact. 9: 285-300. 1924.—So-called pin-point colonies developing from agar plates poured from milk dilutions are due to one of several causes: (1) Overcrowding in plates poured from too low dilutions; (2) improperly made media; (3) certain non-thermophilic bacteria; (4) *Lactobacillus thermophilus* n. sp. The latter is a non-pathogenic, non-spore-forming rod whose optimum temperature is above 50°C. and which multiplies rapidly at pasteurization temperatures. A full cultural and morphological description is given.—C. E. Skinner.

5533. BREED, R. S., AND MARGARET E. BREED. The type species of the genus *Serratia*, commonly known as *Bacillus prodigeosus*. Jour. Bact. 9: 545-557. 1924.—Although first used prior to 1883, the date set by the Society of American Bacteriologists before which the rules of priority should not hold, *Serratia* should, in the opinion of the authors, be retained as the generic name of red chromogenic, non-spore-forming rods, the type of which is known in the literature as *Bacterium prodigeosum* L. & N., or as *Bacillus prodigeosus* Flüge. The description of *Erythrobacillus pyosepticus* Fortineau, the type species of that genus, is inadequate, thus *Erythrobacillus* is to be considered a *nomen abortivum*. Other generic names are also dealt with and a full synonymy is given. *Serratia marcescens* Bizio is too considered the type species.—C. E. Skinner.

5534. BREKENFELD. Über den Nachweis von Anaerobiern in Fleischwaren und deren Zusammenhang mit Magendarm-störungen. [Demonstration of anaerobes in meat-products and their connection with gastro-intestinal disturbances.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 48: 174-175. 1924.

5535. EDDY, SAMUEL. Presence of living organisms in lake ice. Trans. Illinois State Acad. Sci. 17: 85-86. 1924 [1925].—Samples from ice and from water below the ice of Lake Decatur near Decatur, Illinois, were taken during zero weather. A sample of mud from near the shore was also taken. Bacteria and *Chlamydomonas* developed in the culture from ice. In the cultures from water and mud various protozoa and many bacteria were found. Cultures were made at various other times with similar results. It seems that *Chlamydomonas* is the only form of protozoa in Lake Decatur able to survive freezing and thawing.—H. W. Anderson.

5536. HALL, IVAN C., AND EMELIA C. PETERSON. The detection of *Bacillus botulinus* and *Bacillus tetani* in soil samples by the constricted tube method. Jour. Bact. 9: 201-209. 1924.—Out of 20 1-gm. samples of soils from different parts of California, the authors were able to demonstrate that 7 contained viable *B. botulinus* types A; 1, *B. botulinus* type B; 2, *B. botulinus* types A and B; 3, *B. tetani*; 1, *B. botulinus* types A and *B. tetani*; and 6 contained no toxin-forming anaerobes. The findings of Meyer and associates on the subject of the presence of anaerobes in soil and mutation of *B. botulinus* are discussed in relation to these data.—C. E. Skinner.

5537. HOUSTON, ALEXANDER. Eighteenth annual report on results of chemical and bacteriological examinations of the London waters for the twelve months ending March 31, 1924. 89 p. Metropolitan Water Board: London, 1924.—This report is a thorough presentation of the results of treatment of the London water supply for the period mentioned, including bacteriological, chemical and microscopical analyses in tables, meteorological data, and photographs and diagrams.—(*Public Health Engineering Absts.*)

5538. KOSER, STEWART A. Correlation of citrate utilization by members of the colon-aerogenes group with other differential characteristics and with habitat. Jour. Bact. 9: 59-77. 1924.—A number of strains of *Bacterium coli* and *Bact. aerogenes* were studied and grouped as to reaction to the following criteria: ability to utilize uric acid as a source of N, ability to use salts of citric acid as energy source, methyl red reaction, and production of acetyl methyl carbinol ("Voges-Proskauer Test"). It was found that these bacteria grouped themselves into 3 divisions: (1) The uric acid, citrate, and V.P. negative, and methyl red positive *B. coli* of fecal origin; (2) the uric acid and V.P. negative, and citrate and methyl red positive *B. coli* of non-fecal origin; (3) the uric acid, citrate, and V. P. positive, and methyl red negative *B. aerogenes* of non-fecal origin. The V.P. and methyl red tests were occasionally variable and irregular. Differentiation by citrate media has a probable use in indicating

the source of the "colon bacilli" encountered in sanitary bacteriological analysis of drinking water.—C. E. Skinner.

5539. KULP, WALTER L., AND LEO F. RETTGER. **Comparative study of *Lactobacillus acidophilus* and *Lactobacillus bulgaricus*.** Jour. Bact. 9: 357-394. 1 pl. 1924.—A very thorough biochemical and morphological study of the above named bacteria was made. It was concluded that there is not sufficient difference between them to classify them as separate species and that they "should be placed in one and the same species of which *L. acidophilus* is the central type and *L. bulgaricus* a variant" [variety?]. However, no new combination was made.—C. E. Skinner.

5540. LEVINE, MAX, G. A. AJWANI, AND J. C. WELDIN. **The Morgan group of paratyphoids.** Amer. Jour. Public Health 15: 17-21. 1925.—Thirty strains of bacilli isolated from diarrheal stools of infants in Washington, D. C., during the summer of 1919 and 1 strain secured from the American Museum of Natural History were studied as to their morphological, cultural, and agglutination characteristics. The organisms resembled one isolated from a similar source by H. de R. Morgan in 1906, which has since come to be known as *Bacterium (Salmonella) Morgani*. On the basis of the characteristics shown, they fell into 3 groups, one of which appears to be identical with the original Morgan organism.—C. A. Ludwig.

5541. NIEMEYER, LUDWIG. **Azotobacter-Studien.** [Azotobacter studies.] Bot. Archiv. 7: 347-374. Fig. 1-3. 1924.—The presence of *Azotobacter* is markedly dependent on the aeration of the soil. Of all soils examined 54% contain *Azotobacter*. For the occurrence of *Azotobacter*, pH 5 is the limit at the acid end. The upper alkali limit could not be obtained, but is above pH 8. All soils without *Azotobacter* were under pH 5.5. Of the fields considered, over 74% contained *Azotobacter*. In cell size and form there is considerable variation, but not as extensive as that given by Löhnis and Smith.—William Seifriz.

5542. REDDISH, GEORGE F. **Clostridium putrificum. III. A comparison of strains obtained from collections in this country and abroad.** Jour. Bact. 9: 321-326. 1924.—There are 2 species of anaerobes which are labelled *Clostridium putrificum* (*Bacillus putrificus* Bienstock), one of which is the organism as described, and the other *C. sporogenes*.—C. E. Skinner.

5543. ROBINSON, ELLIOTT STERLING. **Antigenic relationships of Bact. typhosum. II. Complement-fixation.** Jour. Bact. 9: 409-426. 1924.—By testing 118 strains of *Bacterium typhosum* with 9 sera in complement-fixation tests, antigenic differences in these strains are clearly brought out. The differences are probably qualitative in nature, and are not of a kind to render possible the demonstration of antigenic groups. The complement-fixation test, if carried out with appropriate sera, offers a simple method of identifying "inagglutinable" or "atypical" strains of *B. typhosum*.—Author's Summary.

5544. ROGERS, L. A. **Transfer of the collection of type cultures of bacteria.** Science 61: 179. 1925.—The collection established by C.-E. A. Winslow and recently maintained at the Army Medical Museum, has been transferred to the McCormick Memorial Institute of Chicago. Its maintenance and the distribution of cultures at a low price will be under the direction of L. Hektoen, Director of the McCormick Institute.—C. J. Lyon.

5545. SEDDON, H. R. **The specific identity of *Bacillus parbotulinus*.** Proc. Roy. Soc. Victoria N.S. 35: 159-163. 1923.—The author previously (Jour. Comp. Path. and Therapeutics 35: 147. 1922) gave an account of an anaerobic toxin-forming bacillus which resembled *B. botulinus* but differed sufficiently to warrant being made a distinct species, *B. parbotulinus*. The organism was recovered from bone of an animal that died of Tasmanian Midland cattle disease, which is known also in Australia and apparently is identical with Lamziekte of South Africa. Administration of bacteria-free filtrates of cultures of *B. parbotulinus* were followed by the same symptoms, progressive bulbar paralysis, recognized in the above named disease which is also termed Toxic Bulbar Paralysis. In the horse, administration of toxic filtrates led to symptoms identical with those due to botulinus toxin. Forage poisoning (Cerebrospinal meningitis) in the horse has been shown to be due to Botulism. At least 3 organisms appear to be capable of causing this, namely, *B. botulinus* types A and B, and *B. parbotulinus*. In Australia, no toxicogenic bacilli have yet been recovered from suspected fodder in the case of the horse. In 2 disease outbreaks, blood serum tests of chronic or recovered cases have indicated specific antitoxins, and *B. botulinus* type A or B appeared to be responsible. *B.*

parabotulinus would appear to be a common cause in cattle. An account is given of investigations using the toxin. The conclusions arrived at are: (1) that *B. parabotulinus* produces a true toxin, that is, a soluble exotoxin obtainable by filtration, causing symptoms only after a definite period of incubation, and capable of inducing the formation of an antitoxin; (2) that though the toxins of both species are identical in their action, the antitoxin to the one does not protect against the other, and vice versa; and (3) that *B. parabotulinus* differs from *B. botulinus* (types A and B) and has a specific identity because, morphologically and culturally, it was found that it (a) was distinctly larger, (b) formed a wholly branched colony in solid media, and (c) failed to show gas formation in glucose media; and finally, now, because it has been shown by toxin-antitoxin tests that it is distinct.—*Eloise Gerry.*

5546. THORNTON, W. G., AND N. GANGULEE. Seed inoculation of lucerne (*Medicago sativa*) and its relation to the motility of the nodule organism in soil. *Nature* 114: 932-933. 1924.—There is evidence that the bacteria do not travel far within the root, hence their spread in the soil after artificial introduction is important. By a modification of Winogradsky's method of staining bacteria in soil, the authors found the organisms to progress through light, sterile soil at the rate of 1 inch in 24 hours. Their activity is hastened by using skimmed milk as an inoculum and further by addition of 0.1% soluble calcium phosphate.—*O. A. Stevens.*

5547. UPHOF, J. C. TH. Purple bacteria as a symbionts of a lichen. *Science* 61: 67. 1925.—The red color found at the margin and on the lower surface of the crust-like lichen, *Chiodecton sanguineum* (Sw.) Waino., is due to the presence of purple bacteria. These bacteria take the place of the alga in this species. They belong to the genus *Rhodobacterium* and have been given the name *R. lichenophora* n. sp. and the name of the lichen has been changed to *Rhodobacteriophora sanguinea* by the writer. It is found in Florida and Cuba.—*C. J. Lyon.*

MYXOMYCETES

5548. WILSON, M., AND E. J. CADMAN. The life-history and cytology of *Reticularia lycoperdon*. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 488. [1924].

PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

(See also in this issue Entries 5107, 5109, 5434, 5437)

5549. ARBER, E. A. N. Critical studies of coal-measure plant impressions. *Jour. Linn. Soc. Bot. London* 46: 171-217. Pl. 8-15, fig. 1-2. 1922.—The paper consists of 3 distinct sections. The 1st is a critical revision of the British Upper Carboniferous species of the genus *Lepidostrobus* Brongn., preserved as incrustations. The discrimination of species in this genus has always been difficult owing to the small range of variation, except in size and shape. The shape of the sporophyll is made the basis of specific distinction. Three subgenera are recognized and named: *Eulepidostrobus*, in which the sporophylls are comparatively leaflike; *Ortholepidostrobus* in which the distal portion of the sporophyll is greatly expanded in comparison with the proximal or pedicel region; and *Sublepidostrobus*, in which the proximal portion of the sporophyll is much better developed than the distal region. The 2nd subgenus is further separated by the caducous nature of the sporophylls. The isolated sporophylls have been long referred to the genus *Lepidophyllum*. The species of the subgenera—2, 10, and 2, respectively—are critically described and fully figured, with synonymy, diagnosis, and discussion.—Section II contains a critical taxonomic study of 2 common species of *Lepidodendron* which have been confused, *L. lycopodioides* Sternb. and *L. ophiurus* Brongn., and of a 3rd species, *L. loricatum*, described as new. The 3 species are all types with small leaf bases, and are distinguished largely on the characters of the leaf scars, though great variations occur in size and shape of the leaf base in each. It is shown that *L. lanceolatum* Lesq. is identical with *L. lycopodioides*, and that *L. simile* Jong. is a confusion of that species with *L. ophiurus*.—Section III is a critical taxonomic study of the frond species, *Neuropteris obliqua* Brongn., *N. acuminata* Zeiller, and *N. impar* Potonié.

The fronds of *N. obliqua* are dimorphic, and confusion has arisen between one form of this species and a plant which the author determines as *N. callosa* Lesq.—A. J. Eames.

5550. BANDULSKA, H. A preliminary paper on the cuticular structure of certain dicotyledonous and coniferous leaves from the Middle Eocene flora of Bournemouth. Jour. Linn. Soc. Bot. London 46: 241-269. Pl. 20-21, fig. 1. 1923.—This paper describes the cuticular structure of Tertiary leaves and compares this with that of some living forms, the anatomical evidence secured being of value as additional evidence of the identification of the leaves. Three new species of *Dicotylphyllum* (a new genus proposed for dicotyledonous leaves of uncertain affinity), *D. Stopesii*, *D. spiculatum*, and *D. sinuatum*, are described from their cuticular structure. Certain fossil gymnospermous leaves were also studied in the same way and compared with living forms. *Araucarites Göpperti* appears to be a true *Araucaria*. *Taxodium europaeum* shows most likeness to *Taxodium* and is not likely to be a form of *Sequoia*.—A. J. Eames.

5551. BERTSCH, KARL. Die neolithische Flora von Ravensburg. [The neolithic flora of Ravensburg.] Bot. Archiv. 7: 175-195. 2 fig. 1924.—In Neolithic times the Ravensburg Valley was inhabited by man. The stone age men here carried on agriculture in wheat, barley, millet and lentils. From the ice age to the end of the Neolithic the Ravensburg Valley was a sea. The original forest of the valley basin was deciduous with birch predominating. The present conifer forest arose first under the influence of man in historical times. The present flora of this valley basin was already fully present in the Neolithic. Only in late times did cultivated plants come in.—William Seifriz.

5552. CHIOVENDA, EMILIO. La Culla Del Cocco. [The birthplace of the coconut. Part 5.] Webbia 5: 359-449. 1923.—Historical arguments. The historical evidence relating to the origin of *Cocos nucifera* is divided into 2 sections. (1) Old World: No certain reference to the coconut is found in the literature of Egypt. In India it is mentioned in the oldest medical literature (1400 B. C.). Ctesia states that in 400 the oil of the coconut was widely distributed in India. According to Tianeos the palm was largely cultivated in the Ganges plains in the 1st century, A.D. The oldest certain reference to the coconut in Ceylon was in 1153, A.D. In 2 Arabic reports (851 and 870) it is stated that the tree was extensively grown in the Maldivan and Laccadivan Islands, that its parts were put to many uses by the natives, and that there existed at that time in India a religious sect which made it an act of devotion to distribute the tree in the islands where it was lacking. These accounts also mention the coconut as a staple food in Java and Sumatra. Marco Polo considers it native there, as well as in the Nicobar Islands. Pyrard holds the coconut to be spontaneous and indigenous in the Maldives. Rumph and Rock believe it to have been distributed in the Pacific Archipelagos by easterly flowing currents. Literary testimony, therefore, indicates the northwestern portion of the Indian Ocean as the region of greatest antiquity for the coconut. (2) New World: Columbus did not see *Cocos nucifera* in Cuba. There is no indication in the literature of its being native in the Antilles; De Rochefort and Du Tertre, in fact, expressly mention its introduction into the French Antilles. It is designated as exotic for Brazil by Piso and by an unknown Portuguese author quoted by Cook. There is no mention of the coconut in Colombia as an important fruit in a list which dates back to 1543, nor can records for that region given by Cieza de Leon and Velasco be referred with certainty to *Cocos nucifera*. Accounts of its existence in the vicinity of the cacique Chiman apparently refer to some other tree. Hernandez states explicitly that it has been introduced into Mexico. According to Wafer it was common in the Coco Isle (5°15'N. lat.) in 1685, by which time, however, it might easily have been introduced and cultivated. The term "Maran" found by Heller among the natives of Nicaragua to indicate the coconut instead of suggesting an American origin for the tree in oriental India, indicates rather that the natives using the term came themselves from India. The term "coco" used for the fruit of this tree is certainly of Portuguese origin because the older writers agree in considering it so, because the Mexican term "coco" signifies herb and not palm, and because it was used by others before de Oviedo, for example, by Barbosa and Pigafetta who learned it from the Portuguese. The probable distribution of the coconut in tropical cultivation is as follows: It was introduced into Mozambique by the Portuguese between 1498 and 1510, thence

into the region of the Congo delta, later to St. Thomas Island, and finally into Brazil, when the Portuguese made their conquest of that country. This palm grew in sufficient abundance in the Philippines to astonish the Spaniards when they colonized there, and the fact that they have left careful records of the plants introduced by them into America, yet make no mention of the coconut, is certainly a proof that this palm does not owe its introduction in America to them.—There follows a general recapitulation covering also Parts 1-4 of this article (see Bot. Absts. 11, Entry 4287), all of the evidence considered by the author tending to indicate the northwestern portions of the Indian Ocean as the birthplace of *Cocos nucifera*—John M. Fogg, Jr.

5553. CHOW, T. C. The lower liassic flora of Sofiero and Dompäng in Scania [Sweden]. Arkiv Bot. 19: 1-19. 2 pl. 1924.—The following species are dealt with: *Equisetites Mobergii* Möller, *E. sp. cf. Thaumapteris Schenki* Nath., *Dictyophyllum Nilssoni* (Brgrn.) Göpp. cf. *Andriania baruthina* F. Braun, *Sagenopteris Nilssoniana* (Brgrn.) Ward., *Marathiopteris hoerensis* (Schimp.) Thomas, *Nilssonia polymorpha* Schenk, *Anomozamites gracilis* Nath., *Ginkgo Hermelini* (Nath.) Hartz., *Ginkgo* or *Baiera* sp., *Baiera taeniata* F. Braun, *Baiera cf. angustifolia* Heer, *Baiera cf. spectabilis* Nath., *Baiera cf. Czekanowskiana* Heer, *Czekanowskia rigida* Heer, *Palissya* sp. and *Pityophyllum longifolium* (Nath.) Möller. Tables show the geographical and geological distribution of these species.—O. Heilborn.

5554. COCKERELL, T. D. A. Plant and insect fossils from the Green River Eocene of Colorado. Proc. U. S. Nation. Mus. 66¹⁹: 1-13. Pl. 1, 2. 1925.—Among the plants listed from this middle Eocene horizon, *Lejeunea eophila*, *Populus wilmattae*, *Bumelia coloradensis*, *Dalbergia knowltoni*, *Amorpha utensis*, *Clethra* (?) *lepidioides*, *Potentilla* (?) *byrami*, *Alsinites revelatus*, *Lomatia obtusiuscula*, *Banksites lineatulus* and *Liquidambar callarche* are described as new, and *Phyllites coloradensis* Knowlton is referred to the genus *Melia*.—E. W. Berry.

5555. EDWARDS, W. F. On the cuticular structure of the Devonian plant *Psilophyton*. Jour. Linn. Soc. Bot. London 46: 377-385. Pl. 37, fig. 1-5. 1924.—The paper deals with the epidermal structure of *Psilophyton princeps* Dawson, as seen in cuticular preparations. The cuticle of this plant has remained practically unchanged since Lower Devonian times. It reveals the presence of stomata on the stem, but none are present on the highly cuticularized spines. These spines thus differ from the spinelike leaves of *Asteroxylon*; they were clearly not concerned with assimilation, and should be looked upon as emergences, not as leaves. The epidermis resembles in a general way that of members of the *Psilophytales* from the Rhynie Chert, but the stomata differ in the presence of cuticular thickenings and the epidermal cells are usually papillate and not ridged. Cuticular comparisons suggest that *Psilophyton* is more nearly related to *Asteroxylon* than to *Rhynia*.—A. J. Eames.

5556. FENTON, CARROLL LANE, AND MILDRED ADAMS FENTON. The stratigraphy and fauna of the hackberry stage of the upper Devonian. Contrib. Mus. Geol. Univ. Michigan 1: 1-260. Pl. 1-45. The Macmillan Co.: New York, 1924.—In this volume, devoted to the stratigraphy and paleozoology of the Hackberry stage of the upper Devonian of Iowa, 3 species of supposed algae are described: *Gracilirectus hackberryensis* Webster, *G. delectatus* n. sp. and *G. pistillus* n. sp.—E. W. Berry.

5557. FRITEL, P.-H. Contribution à l'étude des flores tertiaires d'après les matériaux du Muséum d'Histoire naturelle. IV. [Contribution to the study of tertiary floras based upon material in the Museum.] Bull. Mus. Hist. Nat [Paris] 27: 576-580. 1921.—This is a revision of the Aquitanian flora of Coumi (Greece), which enumerates 45 fossil plants collected in Euboea, and includes notes of a more detailed character on the following: *Pinus parvinucula*, *Phragmites oeningensis*, *Myrica lignitum*, *Alnus sporadum*, *Quercus mediterranea*, *Q. Zoroastri*, and *Q. oreadam*.—John M. Fogg, Jr.

5558. IWASAKI, CHOZO. Supplements to "A fundamental study of Japanese Coal, Part I." Tech. Repts. Tohoku Imp. Univ. 4³: 49-51. Fig. 2. 1924.—The author describes yellow bands in Japanese brown coals as cuticles.—E. W. Berry.

5559. M., E. W. Phylogeny as an independent science. [Rev. of: FRANZ, VICTOR. Geschichte der Organismen (Story of organisms). xiv + 948 p. Gustav Fischer: Jena, 1924.] Nature 114: 889-890. 1924.—The reviewer considers that the author is unfortunate in his methods of treatment and conclusions.—O. A. Stevens.

5560. M., E. W. [Rev. of: FELIX, JOHANNES. *Leitfossilien aus dem Pflanzen- und Tierreich in systematischen Anordnung.* (A systematic arrangement of fossil plants and animals.) vii + 228 p. Wilhelm Engelmann: Leipzig, 1924 (see Bot. Absts. 14, Entry 4546).] *Nature* 114: 713. 1924.—This evidently is intended as a reference manual for elementary students.—O. A. Stevens.

5561. MORELLET, L., ET J. MORELLET. A propos de la communication de M. R. Abrard sur la faune des sables de Chars, de Cresnes, de Marines et du Ruel. [The communication of M. R. Abrard upon the faunas of the sands of Chars, Cresnes, Marines and Ruel.] *Compt. Rend. Soc. Géol. France* 3: 35–36. 1925.—The authors record the following Dasycladaceae from the upper Eocene of the Paris basin: *Cymopolia elongata* and *C. Zitteli*, *Larvaria limbata* and *L. auversiensis*, *Neomeris arenularia*, *Dactylopora cylindracea*, *Acicularia pavantina*, *Clypeina Pezanti*, and *Clypeina* sp.—E. W. Berry.

5562. NOBES, E. DOROTHY. A preliminary note on the fossil woods from some Australian brown coal deposits. *Trans. and Proc. Roy. Soc. South Australia* 46: 528–536. 11 fig. 1922.—Material was secured from the Moorlands mine and from Yallourn, Gippsland, Victoria. Of 45 pieces from the former, 23 were coniferous and 4 angiospermous, the balance undeterminable. Two forms of *Mesembryoxylon* were present in the Moorlands material and 2 from the Yallourn location, together with *Cupressinoxylon*, and *Dadoxylon*.—Wm. Randolph Taylor.

5563. PEARSALL, W. H. The ages of peat deposits. *Nature* 114: 829–830. 1924.—This is a brief discussion of the evidences of the age of deposits in Great Britain.—O. A. Stevens.

5564. RAINERI, RITA. Alghe fossili mioceniche di cirenaica raccolte dall' Ing. C. Crema. [Fossil Miocene algae of Cyrenaica collected by Engineer C. Crema.] *Nuova Notarisia* 35: 28–46. Fig. 1–17. 1924.—Ten species were found, of which 7 are definitely named. Eight belong to the unsegmented Corallinaceae and 2 to the Siphonales (*Cymopolia* sp. and *Microcodium* sp.). *Archaeolithothamnium intermedium*, *A. cyrenaicum*, *Lithophyllum Lemoini*, and *L. Cremae* are described as new.—Marshall A. Howe.

5565. SEWARD, A. C. A study in contrasts: the present and past distribution of certain ferns. (Hooker lecture, 1922.) *Jour. Linn. Soc. Bot. London* 46: 219–240. Pl. 16–19. 1922.—Plant geography based upon the data gathered from existing plants is necessarily incomplete; it must be supplemented by records of the rocks. By reference to the distribution of certain ferns from the Mesozoic to the present, the author “aims to connect . . . the Past with the Present without over emphasizing the boundary between what is and what was.” The following families are “passed in review,”—Gleicheniaceae, Matonineae, Dipteridinae, Schizeaceae, and Marattiaceae. The distribution of all these families and of many genera in each was formerly much greater than today. Among the ferns, at least, vigorous development and rapid spread belong to early stages in their careers, and restricted distribution at the present time is best interpreted as declining vigor in competition. The plates are maps showing present and past distribution of the ferns groups discussed.—A. J. Eames.

5566. SEWARD, A. C. Cretaceous floras of Greenland. (Abstract.) *Rept. British Assoc. Adv. Sci.* 1923: 491. [1924].

5567. THOMAS, H. HAMSHAW. The Caytoniales, a new group of angiospermous plants from the Jurassic rocks of Yorkshire. *Phil. Trans. Roy. Soc. London B* 213: 299–363. Pl. 11–14. 1925.—Fruit, seed and stamens, of what appear to be angiospermous plants from the middle Jurassic of Yorkshire are recorded and described. The material is all preserved as carbonized inclusions, but the author, by a new and laborious chemical treatment which he describes, has been able to make out considerable of the structure. These remains are referred to the 2 new genera *Gristhorpia* and *Caytonia* and to the old genus *Antholithus*. All the species are new. *Gristhorpia nathorsti* consists of stalks with 2-ranked, pedunculate, small, spherical carpels with flap-like stigmas at their bases, and enclosing 10–12 small elliptical seed in which the micropyles and parts of the cuticles can be made out, as well as winged pollen grains like those found in the anthers of the associated *Antholithus arberi*. *Caytonia sewardi* shows stalks with 2-ranked, pedunculate carpels, also with basal stigmas and containing several seed with 2 integuments and micropylar canal, similar to but differing

in details from the preceding. *Antholithus arberi* comprises groups of stalked winged anthers containing winged pollen like that found in *Griethorpia*. The only foliage which, in the judgment of the author, could represent the foregoing is that known as *Sagenopteris phillipsi*, which represents a widespread Mesozoic type. This conclusion is based upon abundance, association and similarity in cuticular features. These remains are considered to be related to one another, and to constitute a new and probably primitive group of angiosperms for which the name Caytoniales is proposed.—*E. W. Berry*.

5568. TURNER, HOMER G. Microscopic structure of anthracite. Amer. Inst. Min. & Met. Eng. Advance Paper. No. 1409-1. 21 p., 21 fig. Feb., 1925.—The author describes a method which he has perfected for studying the structure of anthracite coal, by which small blocks are polished, etched by heat, and studied by reflected light in a metallographic microscope. This method brings out the structure very well and the disclosed organic remains are copiously illustrated.—*E. W. Berry*.

5569. ZALESSKY, M. D. On new species of Permian Osmundaceae. Jour. Linn. Soc. Bot. London 46: 347-358. Pl. 32-34. 1924.—The paper describes in details and illustrates the following new species of Osmundaceae found in the Permian rocks of the Ural Mountains: *Thamnopteris Kidstoni*; *T. Gwynne-Vaughani*; and *Zalesskya uralica*. There is also included a description of a specimen of *Bathypteris rhomboidalis*.—*A. J. Eames*.

PATHOLOGY

FREDERICK V. RAND, *Editor*

LILLIAN C. CASH AND HARRY BRAUN, *Associate Editors*

(See also in this issue Entries 4986, 4987, 4989, 4990, 4992, 4996, 4999, 5006, 5022, 5060, 5066, 5094, 5121, 5131, 5162, 5163, 5189, 5196, 5197, 5201, 5206, 5220, 5223, 5230, 5245, 5266, 5267, 5269, 5281, 5327, 5361, 5415, 5482, 5494, 5498, 5507, 5508, 5510, 5511, 5515, 5527, 5535, 5840, 5867, 5868, 5870, 5871, 5872, 5886, 5926)

DISEASES CAUSED BY FUNGI

5570. ARLAND, ANTON. Der Hafer-Flugbrand, *Ustilago avenae* (Pers.) Jens. Biologische Untersuchungen mit besonderer Berücksichtigung der Infektions- und Anfälligkeitsfrage. [Infection by the oat smut.] Bot. Archiv. 7: 70-111. 9 fig. 1924.—Smut spores scattered on open flowers of *Avena sativa* germinated in 4 days, and in 6 days a long mycelium was present. At a temperature of 30°C. no conidia were formed but only mycelia. The formation of gemmae was often observed. The gemmae arose as parts of the mycelium or as transformation of the conidia. Infection of seed of *Avena nuda* var. *chinensis* with smut spores produced 78% infection; with conidia, only 20%.—*William Seifriz*.

5571. ARMSTEAD, DOROTHY, AND SYDNEY CROSS HARLAND. The occurrence of mildew in black-bordered dhooties. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 475-481. Pl. 1-2. 1923.—“The main organisms concerned in producing mildew damage were an *Aspergillus* of the *niger* group, and a subsidiary *Penicillium*. The most prominent feature of the infection consisted in the presence of numerous streaks and smudges found most abundantly under the black border. For this type of discoloration the *Aspergillus* proved to be responsible. The more abundant growth of *Aspergillus* under the black border was considered to be due to a more favorable water content in this region. In experiments on the relation of water content of the cloth to infection, *Aspergillus* developed in nine weeks on cloth with a water content of 7.8%. It is pointed out that incipient infection is present in practically all yarns, as a result of atmospheric contamination. Methods of preventing mildew are discussed, and the results of experiments with naphthol, thymol, naphthalene and formalin are described. All these substances are shown to be more or less efficacious in preventing fungoid growth. Packing conditions are referred to, and general recommendations for mildew control are put forward.”—*Authors*.

5572. BARBIER, A. M. **Sur une alteration de la Betterave causée par un Sclerotium.** [A disease of sugar beet caused by a Sclerotium.] *Rev. Path. Vég. et Entomol. Agric.* 11: 160-163. *Fig. 1-5.* 1924.—A Sclerotium, morphologically related to *S. Oryzae*, was grown from diseased beet roots in Morocco.—*J. Dufrenoy.*

5573. BIRMINGHAM, W. A. **"Black leg" of cabbage.** *Agric. Gaz. New South Wales* 35: 901-903. *2 fig.* 1924.—Methods of control for this disease, caused by *Phoma lingam*, are given. At certain points in New South Wales the disease has caused considerable damage.—*L. R. Waldron.*

5574. BLARINGHEM, L. **Variation de la sporulation du Puccinia Malvacearum Mont. sous l'influence du greffage des hôtes.** [Variation in spore formation induced in Puccinia Malvacearum by grafting the host plants.] *Rev. Path. Veg. et Entomol. Agric.* 11: 124-131. 1924.—Normal plants of *Lavatera arborea*, actively growing even through winter, had their green leaves heavily rusted by *Puccinia Malvacearum*, while no sori were observed on the mottled leaves of neighboring plants affected by panachure. Severe infection developed on the mottled leaves, however, when the shoot bearing them was grafted onto a normal green plant. It is concluded that the sap ascending from the rootstock is responsible for the development of sori by the rust.—*J. Dufrenoy.*

5575. BLOMFIELD, JAMES E. **Witches brooms.** *Jour. Roy. Microsc. Soc. London* 1924: 190-194. *Pl. 16-17, 7 fig.* 1924.—Large bud-tumors growing on birches are described, as to their manner of development, and their external and internal structure. They originate with the hypertrophy and proliferation of a single bud. The disease is due to a species of *Eoasacus*, and infection probably occurs through the wounds made on the leaves by a leaf-mite, *Phytoptus*.—*Ralph E. Cleland.*

5576. BRAY, M. W., AND T. M. ANDREWS. **Chemical changes of groundwood during decay.** *Indust. and Eng. Chem.* 16: 137-139. 1924.—The more important chemical changes, together with the losses in weight, which take place in groundwood as a result of infection with specific organisms in pure culture have been studied. From the data obtained, it has been shown that the brown-rot organisms studied have a selective action on cellulose and act on the lignin only to hydrolyze off a part of its methoxyl groups. The loss in cellulose in the case of extreme decay was 54%, with an accompanying loss of 3% of lignin. The 2.8% loss in methoxyl content practically accounts for the loss in weight of the lignin. The loss in weight and chemical changes which the groundwood undergoes during a given time interval and under 1 set of conditions vary considerably with the nature of the organisms causing the decay. The organisms used in these tests were *Fomes roseus*, *Lentinus lepideus*, *Peniophora tabacina* and other Hymenomycetes.—*Henry Schmitz.*

5577. BRIGHT, THOMAS BINSTED, LESLIE EWART MORRIS, AND FREDERIC SUMMERS. **Mildew in cotton goods.** (British Cotton Indust. Res. Assoc.) *Jour. Textile Inst.* 15: T 547-558. *Pl. 1-4.* 1924.—"The mildew problem is discussed in popularized form and in the light of modern knowledge concerning the mold fungi, especially their conditions of growth. The various effects of mildew action on cotton goods are also reviewed and reference is also made to a number of cases which have been investigated, describing the organisms which have been isolated. On measures for the prevention of mildew, it is shown that the present knowledge of the efficiency of antiseptics in size is quite unsatisfactory and that more is to be hoped, at present, from methods of sanitation and better conditions of packing and storage."—*Author's summary.*

5578. DEAN, DANIEL. **Spraying for late blight and rot in 1924.** *Potato News Bull.* 2: 52, 54-56. 1924.—The attack by late blight in 1924 came at the end of the season, but killing of the tops by frost was correspondingly delayed. A heavy rain immediately before harvesting caused widespread but light infection of tubers, which was not detected at the beginning of storage. Now, considerable loss due to late blight is reported. To protect against late season infection, spraying must be continued until the vines are dead, notwithstanding vine mutilation.—*F. Weiss.*

5579. DORAN, WM. L., AND A. V. OSMUN. **Combating apple scab.** *Massachusetts Agric. Exp. Sta. Bull.* 219. 1-17. 1924.—This presents the results of the experiments of 1923 and a summary of 3 years' results. Sulphur dust gave satisfactory control with 5 applications.

Liquid lime sulphur, 1-50, and dry lime sulphur, 4-50, were of equal value. Atomic sulphur gave just as good control as did lime sulphur. The substitution of copper sprays for the earlier applications did not increase efficiency.—*P. J. Anderson.*

5580. DOWSON, W. J. A flower spike disease of cultivated *Antirrhinums*. *Gard. Chron.* III. 75: 62. 1924.—This disease, caused by *Sclerotinia sclerotiorum*, wilts the flowers and renders them unfit for cutting. Infection takes place through the stigmas, with probable dissemination by insects.—*P. L. Ricker.*

5581. DOWSON, W. J. A Sclerotia disease of *Narcissus*. *Gard. Chron.* III. 75: 160. 1924.—A disease new to this host is described in considerable detail. A *Botrytis* stage is obtained from the sclerotia.—*P. L. Ricker.*

5582. DRECHSLER, CHARLES. Leaf-spot of maize, a disease distinct from leaf-blight. (Abstract.) *Phytopathology* 15: 47. 1925.—The disease is due to a species of *Helminthosporium* distinct from *H. turcicum* Pass.—*B. B. Higgins.*

5583. DUFRENOY, J., ET M. GAUDINEAU. Sur une maladie causée par un *Coryneum* nouveau. [A disease caused by a new species of *Coryneum*.] *Rev. Path. Vég. et Entomol. Agric.* 11: 164-167. Pl. 1-2. 1924.—A new species of *Coryneum* is reported to kill the cortex of shoots of *Castanea crenata* growing in an orchard of southern France.—*J. Dufrenoy.*

5584. ESCOMEL, E. Essai sur la parasitologie d'Aréquipa (Pérou) et de ses environs. [Parasitology of Aréquipa and vicinity (Peru).] *Bull. Soc. Path. Exotique* 17: 906-925. Fig. 1-2. 1924.—This is a summary of 15 years' observations in the region. The following fungi are mentioned as present: *Discomyces minutissimus*, *Actinomyces bovis*, *Trichophyton tonsurans*, *T. mentagrophytes*, *Trichosporum giganteum*, *Monolia albicans*, *M. vaginalis*, *Malassezia furfur*, *M. muris*, *Pityrosporum ovale*, *Rhinocladium beurmanni*, and *Penicillium* spp.—*Philip Brierley.*

5585. FARIS, JAMES A. Factors influencing the infection of wheat by *Tilletia Tritici* and *Tilletia laevis*. *Mycologia* 16: 259-282. 1924.—Seed of Dawson and of Ontario Agric. Coll. No. 104 varieties of winter wheat inoculated with *Tilletia laevis* and germinated at temperatures of 5, 10, 15, 25 and 30°C. showed the highest infection at the lowest temperatures, with a rapid falling off in infection above 15°C. Similar inoculations with *T. Tritici* gave low percentages of infection, no infection occurring at 20° or above.—Wheat seed germinated in soil gave plants with higher percentages of infection by *T. laevis* than did seed planted in quartz sand. Soil moisture was not found to exert any marked influence on infection with this smut, nor did the date of planting appear to influence infection.—Two spring wheats, Marquis and Red Fife, were tested along with Dawson, against 2 collections each of both smuts, at different temperatures. Marquis gave higher infection at 10° than at 5°, and the percentage of infection fell off at temperatures above 10°. The other 2 varieties gave rather higher infections at 5° than at 10° or higher. About the same amount of smut was found in inoculated plants of winter wheat transplanted outside in the fall, as in plants which were grown to maturity in the greenhouse. Higher infections were found to occur in those plants which came up first.—Kanred and Club wheats were susceptible to certain collections of *T. tritici*, and resistant to others, indicating biologic specialization of this smut.—*G. R. Bisby.*

5586. FERDINANDSEN, C. Biologiske Undersøgelser over Tidselrust. [Biological investigation of thistle rust.] *Nordisk Jordbrugsforskning* 1923: 475-487. 1 pl. 1923.—The vernal generation of *Puccinia suaveolens* (Pers.) Rostr. on Canada thistle is due to teleutospore infection. Hardly more than 2% of the new shoots are inoculated but the mycelium grows upwards in the shoots and downwards in the underground system. The finding of Rostrup, that in the fields about 4% of the shoots are infected, is corroborated. Up to 35% may be attacked but under ordinary farm conditions the autumn generation with the teleutospores will be ploughed under. In a weed-eradication experiment, where the ground was left untreated, rust increased in 4 years according to the following percentages of shoots attacked: 0, 1.44, 10.29 and 26.4%, respectively; in another test, 4, 21.8, 47.4 and 57.1%, respectively. Combating thistles by means of the rust does not seem feasible for practical farming. The vernal generation may survive over winter in rhizome fragments ploughed under. The uredospore infections are found as leaf spots on practically all shoots not attacked by the vernal generation. The autumn attack affects the shoots severely only when uredospores have been extraordinarily abundant.—*Ernst Gram.*

5587. FERDINANDSEN, C. Kampen mod Berberis i Danmark og dens Resultater. [The barberry campaign in Denmark and its results.] Nordisk Jordbrugsforskning 1924: 223-235. 1924.—The serious attacks of black stem rust (*Puccinia graminis*) frequent prior to 1903, in which year the barberry was eradicated, have disappeared totally since that year. The slight attacks which, before 1903, appeared every year have practically disappeared or occur only late in the season. Heavy local attacks discovered since 1903 have nearly always been traced back to barberries hidden in the vicinity. Denmark and the other Scandinavian countries are situated north of the biological boundary of uredospore hibernation, which makes the stem rust entirely dependent on the barberry.—*Ernst Gram*.

5588. FOEX, E. Quelques observations sur le développement des rouilles des céréales dans le Sud-Ouest et le Sud-Est. [Notes on cereal rust infection in Southern France.] Rev. Path. Vég. et Entomol. Agric. 11: 205-211. 1924.—*Puccinia glumarum* brings most damage in the early season before June, then *P. triticea* begins to appear, so that early maturing wheats suffer less from *P. triticea*. Wheats are listed as to their relative susceptibility or resistance to either rust in the places visited.—*J. Dufrenoy*.

5589. FOLSOM, DONALD, AND REINER BONDE. Alternaria Solani as a cause of tuber rot in potatoes. (Abstract.) Phytopathology 15: 49. 1925.

5590. FULTON, HARRY R., AND JOHN J. BOWMAN. Preliminary results with the borax treatment of citrus fruits for the prevention of blue mold rot. Jour. Agric. Res. 28: 961-968. Fig. 1-5. 1924.—Data from preliminary tests show that commercial borax (sodium borate) solution at a strength of 5% or 10% applied to the surface of oranges or lemons and allowed to dry, greatly reduces blue-mold (*Penicillium*) rot under experimental conditions unusually favorable for rot development. Oranges and grapefruit handled in a commercial way, when treated with the borax solution, showed a marked reduction of both Phomopsis and Diplodia types of stem-end rot, as well as of blue-mold rot. The borax treatment gives promise of being commercially valuable in reducing losses from blue-mold rot and from stem-end rot.—*H. R. Fulton*.

5591. GARCIA LOPEZ, ANGEL. La apoplejia de la vid o enfermedad del "Esca." [Apoplexy of the vine.] Bol. Agric. Tec. y Econ. [Spain] 16: 634-651, 721-739. 2 col. pl., 11 fig. 1924.—A disease of the grape vine called apoplexy or "Esca" disease occurs in France and Spain and has been known since 1300. Workers who have studied the disease since 1878 have attributed it to various causes, for the most part non-parasitic. Leaves of infected vines turn brown, twigs die back and defoliation results. Parts of a vine only may be attacked. An internal soft brown rot occurs. *Fomes ignarius*, sometimes resupinate, is always found in connection with diseased vines. The disease works more rapidly under humid conditions and when temperatures are high. All varieties and species of *Vitis* appear to be susceptible. The fungus acts as a wound parasite. Control measures are outlined.—*John A. Stevenson*.

5592. GARCIA LOPEZ, ANGEL. Tratamientos otoñales contra el mildiu. [Autumn treatments against mildew.] Bol. Agric. Tec. y Econ. [Spain] 15: 1034-1037. 1924.—Mildew of the vine (*Plasmopara viticola*), while not serious in Spain in 1923, caused considerable damage in 1922 and may appear at any time that weather conditions are favorable. Precautionary treatments are advised—Bordeaux mixture after the foliage is out, copper sulphate before.—*John A. Stevenson*.

5593. GEISE, F. W. Experiments with inoculated sulfur. Virginia Truck Exp. Sta. Bull. 42. 259-263. 1923.—Preliminary experiments are reported on the use of inoculated sulphur for control of potato scab and its effect on subsequent crops. Applications of 300, 450, and 600 pounds per acre on land known to be infected with the scab organism at Norfolk, Virginia, resulted in only slight increase of percentage of scab-free potatoes. A similar experiment at Onley, Virginia, greatly reduced the number of scabby potatoes. Soy beans planted after potatoes in the treated plots showed no injurious effect from the sulphur, but the yield of subsequent crops of corn and rye was considerably reduced on the sulphur plots.—*J. T. Rosa*.

5594. GRAM, E. De lokale Afsvampningsforsøg. [The local seed disinfection experiments.] Ugeskr. Landmaend 69: 204-206. 1924.—Aside from the State experiments, the local farmers' associations have carried out 12 field-tests with disinfection of barley and 2 with

wheat. Against the heavy attacks of stripe (*Helminthosporium gramineum*), as when Karlebarley shows 65% of diseased plants, Germisan is very efficiently used for sprinkling or steeping, while steeping in copper sulphate solution or in Uspulun is less recommendable.—*Author*.

5595. GRAM, E. Forsøg og Prøver med Afsvampning. [Experiments with seed disinfection.] Ugeskr. Landmaend 69: 559-560. 1924.—In cooperation with the Danish State Phytopathological Station the local farmers' associations conduct experiments and tests with larger amounts of seed grain. Germisan, Wheat-fusariol, Kalimat, Tillantin B, and Uspulun are recommended for comparison with the standard copper sulphate treatment for wheat. Rye-fusariol and Uspulun are recommended for rye in place of formaldehyde as usually applied against *Urocystis occulta*.—*Author*.

5596. HANSEN, H. R. Sortrustangrebenes Hæftighed i Danmark i Tiden 1884-1921. [The severity of black stem rust attacks in Denmark, 1884-1921.] (Printed in abbreviated form in Phytopathology 13: 404-407. 1923.) Nordisk Jordbrugsforskning 1923: 1-6. 1 diagr. 1923.—The correlation of the attacks of *Puccinia graminis* with temperature, precipitation, cloudiness and growth conditions is presented. Since 1904, when the barberry was eradicated, no severe attacks have occurred. During the years 1884-1903, six years with severe attacks and 10 years with less important attacks are noted.—*Ernst Gram*.

5597. HARTER, L. L. Mottle-necrosis of sweet potatoes. (Abstract.) Phytopathology 15: 45. 1925.—The disease is apparently due to a species of *Pythium*.—*B. B. Higgins*.

5598. HARTER, L. L. *Pythium* rootlet rot of sweet potatoes. Jour. Agric. Res. 29: 53-55. Pl. 1. 1924.—A rootlet rot of sweet potatoes in the hotbeds in various parts of the country has been found to be caused by *Pythium*. The disease has its beginning at the end of the rootlet and works progressively upward. It was found to occur on all of the 21 varieties studied.—*Author*.

5599. HIURA, MAKOTO. Studies on the anthracnose of flax. (Japanese.) Jour. Soc. Agric. Forest. Sapporo 15: 1-23. 1923.

5600. JEHLE, R. A., AND E. N. CORY. Spraying for control of diseases and insects of the apple. Maryland Agric. Exp. Sta. Bull. 262. 157-167. 1924.—Spraying experiments during 1921-1922 and 1922-1923 were conducted in 2 Maryland orchards, with special reference to the effect of spraying in the fall just after harvest time for control of the scab disease. When 10-10-50 Bordeaux mixture was applied in the fall, there appeared to be only a slight decrease in number of scabby fruit the following season. Scab was controlled just as well, if the fall application of Bordeaux was omitted, by the regular spring and summer schedule of lime-sulphur sprays, if they were applied thoroughly and at the right time. Bordeaux mixture and concentrated lime sulphur, applied at the pink-bud stage, gave equally good results in the control of scab, but the Bordeaux caused more spray-burn.—*J. T. Rosa*.

5601. JONES, L. K. Anthracnose of cane fruits and its control on black raspberries in Wisconsin. Wisconsin Agric. Exp. Sta. Res. Bull. 59. 1-26. Pl. 1-8, fig. 1-3. 1924.—Anthracnose of cane fruits is caused by the fungus, *Plectodiscella veneta* Burk. The symptoms on black raspberries are given and the development of the disease and host are correlated with meteorological conditions and spraying dates at Madison, Wisconsin. The temperature range of the fungus on dextrose-potato agar is about 11-31°C. with the optimum between 20 and 26°C. Conidia in culture are obtained by transferring fragments from dry to very moist conditions. Ascospores on culture media germinate by 5 to 7 conidia which produce germ tubes. The incubation period is 3 to 9 days. Ascospores may be wind-borne at least $\frac{1}{2}$ mile and cause infection on new plantings. Spraying experiments for the control of the disease were conducted over a period of 3 years using Bordeaux mixture and lime-sulphur with and without such adhesives as glue, gelatin, milk, and casein-lime. Control measures are: (1) Keep weeds in check, to lower humidity; (2) remove old canes from young plant roots in new plantings to reduce inoculum; (3) spray twice, (a) after a few leaves have unfolded, use lime-sulphur, 1-10, and (b) about 1 week before the blooming period, use lime-sulphur, 1-40. A spreader of glue or gelatine may increase the effectiveness. Bordeaux mixture is somewhat less satisfactory than lime-sulphur.—*R. E. Vaughan*.

5602. KEITT, G. W., AND L. K. JONES. Frequencies of ascospores of *Venturia inequalis* in orchard air. (Abstract.) Phytopathology 15: 57. 1925.

5603. KLEBAHN, H. A contribution to the problem of "cereal rusts." Library, Bur. Plant Indust., U. S. Dept. Agric.: Washington, D. C. 1924. [Typewritten translation of: Ein Beitrag zur Getreide Rost-frage. Zeitschr. Pflanzenkrankh. 8: 321-342. 1898.]—The author briefly summarizes his experiments as follows: "With the exception of a single and very doubtful case, the yellow rust, *Puccinia glumarum*, did not appear upon *Hordeum vulgare cornutum*, by Eriksson himself considered as a barley extraordinarily susceptible to yellow rust, and which proved regularly diseased from yellow rust in the experiments made by Eriksson; instead of this, *Puccinia simplex* and *P. graminis* appeared, both of which are frequent in this district. Sori of rust were developed only upon barley-plants which were kept for some time or all the time in the open. Barley-plants of different ages, as well as oats of different ages, became rusty at the same time. The origin of sori of uredo from some germ residing in seed or in hibernated plant-organs could not be proved. I confine myself to these statements. The number of experiments is, however, too small to justify our drawing any conclusions."—*Author's summary.*

5604. LANGE, J. E. Kartoffelsygens Bekæmpelse. [The control of late-blight.] Vort Landbrug 43: 471. 1924.—An opinion expressed by the agricultural leader, Pinstrup, that the control of late-blight still awaits its practical solution, is criticized. Instead of excusing slackness, agricultural leaders ought to support the work for healthier crops. A day's work and a few crowns expenditure for copper sulphate pay better than most work.—*Ernst Gram.*

5605. LEWIS, FRANCIS J. An endotropic fungus in the Coniferae. Nature 114: 860. 1924.—The author reports fungal hyphae in living cells of the roots of *Picea canadensis*, *Larix laricina*, also of *Ledum palustre* and *Vaccinium Vitis-idaea*.—*O. A. Stevens.*

5606. LINDFORS, T. Några bidrag till belysande av fusarieproblemet. [Contributions to the Fusarium question.] Nordisk Jordbrugsforskning 1923: 451-452. 1923.—The most common fusariose in Sweden is snow-mold (*F. minimum*). Laboratory tests for the degree of infection of the seed grain are not exact, Hiltner's tile gravel method, and the examination of centrifugal deposit being the most reliable. Also, the influence of growth factors makes it difficult to prescribe the time to disinfect the seed. In localities where snow-mold is common, disinfection of the rye should be general, except following dry summers. The 2-3 weeks following blossoming of the rye are critical for the infection of the seed. Thus, if the weather has been dry for 3 weeks after flowering, infection will be scarce. In many of the Fusarium attacks, soil infection occurs and in those cases the reaction requirements of the fungi indicate liming to somewhat above the neutral point as an effective remedy.—*Ernst Gram.*

5607. MAGROU, J. L'immunité humorale chez les plantes. [Plant immunity due to content of plant juice.] Rev. Path. Vég. et Entomol. Agric. 11: 189-192. 1924.—Tubers of Orchids (*Ophrydeae*) are never infested by mycorrhizal fungi which infect their roots freely. A thermolabile antibody was proved to exist in these tubers, which inhibits fungal growth. The endophyte (*Rhizoctonia repens*) will not grow on culture media if sterile parts of *Loroglossum* tubers have been deposited on the surface of the agar for a few days, even though they are taken away before the fungus is transferred to the agar.—*J. Dufrenoy.*

5608. MARESQUELLE, M. Sur un Sclerotium parasite du Maïs. [A Sclerotium causing a disease of Zea Maïs.] Rev. Path. Vég. et Entomol. Agric. 11: 156-159. Fig. 1. 1924.—Black spots on shoots of maize from Morocco were observed to be caused by many-celled spores which belong to a new species of *Sclerotium*, *S. monohistum* n. sp.—*J. Dufrenoy.*

5609. MILLARD, W. A., AND SYDNEY BURR. The supposed relation of potato skin spot to corky scab. Gard. Chron. III. 73: 355. 1923.—The article comments on a recent paper by SHAPOVALOV in which the identity of the 2 is disputed.—*P. L. Ricker.*

5610. NEWMAN, RALPH. Hope for oak-root infected orchards. Pacific Rural Press 109: 75. 1925.—The presence of a sturdy Imperial prune tree on myrobalan rootstock in the midst of a half acre where the trees had been killed by oak-root fungus and where other adjacent trees were dying, gives hope that a resistant strain of the myrobalan may be found. Trees which were showing the characteristic effect of this fungus were treated in 1918 by removing all the earth from about their crowns and large roots, and all fungus-infected bark. The roots and crowns were painted with Bordeaux paste and a mass of soil was disinfected by mixing with it equal parts of lime and bluestone amounting to 10% of its bulk. This soil was then packed

around the roots and crowns and the holes refilled with earth. The following year the trees showed decided improvement and are now growing thriftily and bearing normal crops. A cure is not claimed but the results are very promising.—C. S. Pomeroy.

5611. NISIKADO, YOSIKAZU. Ueber die durch *Physalospora* und *Coniothyrium* verursachten Krankheiten der Weintraube in Japan. [Diseases of the vine in Japan produced by *Physalospora* and *Coniothyrium*.] Ber. Ohara Inst. Landw. Forsch. 2: 273-289. 1923.—The disease of the vine in the Caucasus caused by *Physalospora baccae* Cavares has been observed also in Japan since 1913. The 1st sign of the disease consists in peculiar dark spots on the green stalks of the nearly ripe grapes, which quickly grow and hide the stalk; on every spot appear numerous black pustules within which pycnidia soon develop. The berries then dry up and shrink. The pycnidial and perithecial forms are exhaustively described. The fungus was grown on different media, of which grape decoction agar and potato slices have given the best results. Studies of the effect of H-ion concentration on the development showed that the fungus will grow in media of pH 3.4-10 but best at pH 4.2-7.4—The disease of grapes caused by *Coniothyrium diplodiella* (Speg.) Sacc. was first found in 1913 by the author in Japan. Brown spots appear on the stem of the raceme or the fruit pedicels and the berries become rotten and shrunken. On their surface appear pustules in which the pycnidia develop. The fungus is exhaustively described. It grows readily on different media, such as grape fruit decoction agar. Inoculation tests were made with positive results.—Author. (Courtesy Japanese Jour. Bot.)

5612. NISIKADO, YOSIKAZU, AND CHUICHI MIYAKE. Studies on the helminthosporiose of the rice-plant. Ber. Ohara Inst. Landw. Forsch. 2: 133-195. 7 pl. 1922.—The helminthosporiose of the rice-plant, a serious disease caused by *Helminthosporium Oryzae* Breda de Haan, and very common in Japan, is characterized by the production of small, brown, discolored spots on leaves; it attacks also seedlings, culms, necks, heads, etc. The authors have isolated various strains and obtained pure cultures in various nutrient media, such as rice, beef, potato, cherry leaves, and onion soy-agar, etc., and their variation in such media was studied. The conidiophores are erect hyphae which arise in tufts of 2-5 or more and are septate. Their length varies in different media being 43-533.2 μ ; width 5.1-12.75 μ ; the number of septa varies from 2 to 22. Conidia are single at the tips of the conidiophores, 2-13-septate; the measurement of 600 conidia, has given: average length = 73.951 $\pm$ 0.566 μ , variation = 20.553 $\pm$ 0.04 μ ; average width = 17.213 $\pm$ 0.046 μ , variation = 1.681 $\pm$ 0.033 μ ; average number of septa = 6.647 $\pm$ 0.086, variation = 3.138 $\pm$ 0.037. Inoculation experiments on a number of Gramineae were made with success in many cases. The germ-tube is enveloped by a thick gelatinous sheath, easily recognizable by staining with gentian violet; this sheath serves to let the germ-tube adhere firmly to the host tissue. Appressoria are also found. The germ-tubes penetrate the host tissue partly through open stomata, partly through epidermal cells, the latter being effected by mucilaginous sheath and appressoria.—Optimum temperature for conidial germination lies between 25 and 30°, minimum 2° and maximum 41°; optimum for mycelial growth lies between 27 and 30°. Minimum for conidial formation 5-6°, maximum 36-38°. The death point at 10 minutes' exposure is 50-51° for conidia, and 48-50° for mycelia.—The susceptibility of conidia to various chemical substances was tested; they are very susceptible to CuSO₄, HgCl₂, AgNO₃, calcium hypochloride, formalin, etc.—It may be added that the fungus may live for a rather long time; in culture it has retained its vitality as long as 943 days.—Authors. (Courtesy Japanese Jour. Bot.)

5613. ORCHARD, PAUL W. The ounce of prevention. Citrus Indust. 5¹¹: 36-37. 1924.—This is a reply to a criticism by J. G. GROSSENBACHER, of an article by the author (Citrus Indust. 5⁹: 17-19. 1924) relative to the control of fungous diseases of citrus trees. The author, contrary to the results obtained in extensive investigations by a number of workers, advocates the fall use of copper sprays as a remedial measure for such fungous diseases of citrus trees as melanose and scab, which it is generally conceded can not be controlled effectively until spring. He claims to have secured excellent results in the control of insects and fungi by using Bordol, a proprietary preparation in which a fungicide is combined with oil as an emulsion. It is used in the fall prior to the usual spraying in the spring for scab and melanose.—Arthur S. Rhoads.

5614. RHOADS, ARTHUR S. Grape diseases, with special reference to black-rot and anthracnose. Florida State Plant Bd. Quart. Bull. 8: 102-112. 1924; Florida Fruits and Flowers 1: 34-35, 37, 47-49, 104-106. 1924; 2: 18-19, 22. 1925. (See also Bot. Absts. 14, Entry 585.)

5615. RHOADS, ARTHUR S. Ripe-rots of grapes and the copper acetates as non-staining sprays for late applications to control them. Proc. Florida State Hort. Soc. 1924: 154-159. 1924; Florida State Plant Bd. Quarterly Bull. 8: 97-102. 1924; Packing House News 3¹¹: 21, 30-31. 1924. (See also Bot. Absts. 14, Entry 586.)

5616. SCHNEIDERHAN, F. J. Rainfall in relation to ascospore discharge and infection in *Venturia inequalis*. (Abstract.) Phytopathology 15: 56. 1925.

5617. SCHNEIDERHAN, F. J. The seasonal development of apple scab. (Abstract.) Phytopathology 15: 57. 1925.

5618. SCHW[APPACH]. Das Eichensterben in Südosteuropa. [Dying of oaks in south-eastern Europe.] Deutsch. Forstzeitg. 40: 66. 1925.—For 20 years the oak mildew introduced from America has done considerable injury to oaks in Europe. The damage has been particularly severe in Dalmatia and Slavonia, and is greatest where the forests also suffer from defoliation by caterpillars and by grazing animals. Such defoliation never resulted in extensive dying of the trees before the mildew was introduced. Pure stands suffer the greatest damage, while mixed stands with less than 50% oak are practically unharmed.—W. N. Sparhawk.

5619. SEAVER, FRED J. The snapdragon rust. Mycologia 17: 42-44. 1925.—A New York grower reports trouble from this rust due to *Puccinia Antirrhini*. A brief summary of some known control measures is given.—G. R. Bisby.

5620. SHARPLES, A. Some observations on root diseases of *Hevea braziliensis*. Malayan Agric. Jour. 12: 404-407. 1924.—From an examination of roots of different plants attacked by "brown root disease," the writer concludes that more than 1 fungus is responsible for this condition; in particular, he considers that "red root" disease of rubber in Java and "wet rot" of rubber in Malaya are probably caused by 2 different fungi which produce the same symptoms. The fungi are, respectively, *Ganoderma ferreum* Berkeley and *Fomes pseudo-ferreus* Wakefield; they have been thought to be identical. A further note deals with the probable identity of *Kretzschmeria micropus* with *Ustilina zonata*.—R. E. Holtum.

5621. SHERBAKOFF, C. D. The Fusarium conference. (Abstract.) Phytopathology 15: 47. 1925.

5622. STENBÆK, P. Kartoffelskimmelenes Bekæmpelse. [Control of *Phytophthora infestans*.] Vort. Landbrug 43: 492-493. 1924.—Spraying with Bordeaux mixture may pay very well in certain years, but in years with excessive late-summer rains the spray is washed off the leaves. Phytopathologists should find remedies in dust form, or resistant varieties. (In an additional note the editor points to results from the State and local experiments in which dusting was far less efficient than spraying).—Ernst Gram.

5623. SUEMATU, NAOZI. Über eine Botrytiskrankheit der Erdnuss (*Arachis hypogaea* L.) [A *Botrytis* disease of peanuts.] Japan. Jour. Bot. 2: 35-38. 2 pl. 1924.

5624. TAKIMOTO, SEITÔ. The vitality of *Cercospora beticola*. (Japanese.) Ann. Phytopathol. Soc. 1⁵: 43-44. 1923.—The spores of *Cercospora beticola* kept in dry condition at the laboratory were active for 16 months. Spores in the seed were able to germinate until the end of April (sowing season) of the next year. Those on diseased leaves kept under caves were not able to germinate at the beginning of May, but sclerotial bodies or mycelia in tissue survived the winter. The spores of diseased leaves placed on the soil in the field of Suwon (Korea) lose their vitality at the beginning of May, but the sclerotial bodies or mycelia in tissue were very often able to germinate. The same result was obtained in Heijo (Korea), except that a few spores on the under parts of the pile were able to germinate where beet roots were covered with a thin layer of soil. Spores on diseased leaves mixed with wet soil died after 3-4 weeks, in the laboratory.—Author. (Courtesy Japanese Jour. Bot.)

5625. TAYLOR, WILLIAM. Grape growing.—Exploded fallacies. Gard. Chron. III. 73: 258-259. 1923.—The cause and remedy for "scald" and "rust" of grapes are given.—P. L. Ricker.

5626. THOMAS, ROY C. Effective dust treatments for the control of smut of oats. *Science* 61: 47-48. 1925.—Copper and nickel salts were combined with mercuric chloride and the mixture was used in dust treatments of infected seed. It gave better results than any other treatments and even stimulated seed germination.—*C. J. Lyon.*

5627. THOMPSON, A. A preliminary report on a new bark disease of Hevea. *Malayan Agric. Jour.* 12: 163-164. 1924.—A white mycelium is reported as attacking young bark. This appears to have arisen as a saprophyte which caused no damage, but which is becoming actively parasitic, though as yet not widespread.—*R. E. Holttum.*

5628. TOGASHI, KOGO. The mildew of blawort. (Japanese.) *Engei [Horticulture]* 15: 1-3. 1923.—The occurrence of the mildew of blawort seems not to have been previously reported in this country. The fungus is identical with *Bremia Centaureae* Syd.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5629. TUCKER, C. M. Coconut bud rot experiments in Porto Rico. *Science* 61: 186-187. 1925.—The generative tissue of the bud is rotted away and eventually all the leaves fall. A strain of *Phytophthora faberi* Maublanc was isolated from diseased buds and used in successful inoculation experiments in wounded and unwounded mature tissue. Bacteria resembling *Bacillus coli* (Escherich) Migula were isolated but produced infection only in wounded tissues.—*C. J. Lyon.*

5630. UTTALE, J. Finger and toe diseases. *Droitwich. Gard. Chron.* III. 73: 355. 1923.—The article gives the results of several years experiment with lime and iron sulphate.—*P. L. Ricker.*

5631. VARIČAK, B. Studije o čadavici. [Studies on sooty mold.] *Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb]* 34: 45-62. 3 fig. 1922.—The author studied especially the sooty mold occurring on the leaves and twigs of plums in Croatia. The following fungi were found: different species of *Alternaria*, *Cladosporium herbarum*, *Coniothecium* sp., *Dematiium pullulans*, *Hormodendron cladosporioides*, *Triposporium* sp. and other fungi of torulose form belonging to the form-genus *Fumago*. In the greenhouses of the Botanical Garden in Zagreb the author found for the most part a homogeneous growth of mold due to *Fumago vagans* never occurring in the free state and more rarely a heterogeneous one on *Chamaerops*. The sooty mold always occurs with the honey-dew, and is sometimes very injurious since the honey-dew occurs often in large amounts. The only control measure advocated is getting rid of the scale insects, which secrete the honey-dew.—*I. Pevalšek.*

5632. WALKER, J. C., AND E. C. TIMS. A *Fusarium* bulb rot of onion and the relation of environment to its development. *Jour. Agric. Res.* 28: 683-694. Pl. 1-3, fig. 1-3. 1924.—A decay of onion bulbs in the field, in transit and in storage is an important problem in the U. S. A. A number of *Fusarium* species may be instrumental in the bulb rot disease. *Fusarium cepae* Hanzawa has been isolated from decaying onion bulbs from Illinois. Hanzawa's description of the fungus is emended. This fungus is capable of producing a rapid decay of onion bulbs when introduced through wounds. Infection through the unbroken skin does not take place so readily. The disease develops, both in storage and in the soil, at temperatures ranging from 15 to 32°C., and most rapidly at 28-32°. Soil moisture has little effect upon the progress of the disease after infection has occurred. It is shown that the most serious outbreaks of bulb rot occur in regions where the onions are exposed to extremely hot weather during the latter part of the onion-growing season.—*E. C. Tims.*

5633. WEIMER, J. L. *Alternaria* leafspot and brownrot of cauliflower. *Jour. Agric. Res.* 29: 421-441. Pl. 1-4, fig. 1-3. 1924.—A leafspot caused by *Alternaria brassicae* (Berk.) Sacc. and a rot of the curd called brownrot, caused by the same fungus, are described and illustrated. The maximum, optimum and minimum temperatures for the germination of spores of this fungus are 40 to 46°, 33 to 35° and 1.5°C. respectively. The optimum for mycelial growth on Irish potato agar is lower than that for spore germination, namely between 25 and 27°C. The optimum for infection of detached cauliflower leaves lies between 28 and 31°C. The optimum for infection of the heads is between 25 and 30°C. No infection takes place at 34.7° or above. Infection becomes apparent at 1.8° in 5 to 7 days. *A. brassicae* produces invertase and amylase but not pectinase or cytase, at least in demonstrable amounts, when growing on sweet-potato and on cabbage decoctions. These decoctions are made less acid by the fungus.—*Author.*

5634. YEATES, J. S. **Sap-stain in timber of *Pinus radiata* (insignis).** New Zealand Jour. Sci. and Tech. 7: 248-252. 3 fig. 1924.—A brief general account is given of sap-staining and methods of control. In *Pinus radiata* the stain was found both in unsawed logs and in sawed timber, but only in the sap-wood. A description is given of the causal fungus, *Ceratomyella* sp. This fungus was detected on other species of *Pinus*.—H. H. Allan.

5635. ZIMMERLEY, H. H., RAY J. DAVIS, AND HERBERT SPENCER. **Spraying and dusting cantaloupes.** Virginia Truck Exp. Sta. Bull. 45. 293-313. 2 fig. 1923.—Injury to cantaloupes in Tidewater Virginia, by anthracnose (*Colletotrichum lagenarium*), rust (*Alternaria brassicae*) and downy mildew (*Pseudoperonospora cubensis*) is reported to be severe. Investigations on the control of these diseases, extending over 3 seasons and dealing especially with the relative efficiency of dusts and liquid sprays, are reported. Plots sprayed with Bordeaux mixture at 75, 125 and 200 pounds pressure gave the largest vine growth and yield with the lowest pressure of spraying, because of the injurious mechanical effects of the higher pressures.—In 1921, a dry season unfavorable for diseases, Bordeaux sprays increased the yield 10.5%, and copper dust 7.1% over the checks, but in 1922 and 1923, both dusted and sprayed plots yielded less than the checks, due to retarding effects of the fungicides on growth, though diseases were effectively controlled. Accordingly it is recommended that application of fungicides be withheld from cantaloupes until after the early melons have set, or until presence of disease is noted.—J. T. Rosa.

DISEASES CAUSED BY BACTERIA

5636. ANDERSON, P. J., AND G. H. CHAPMAN. **Tobacco wildfire in 1922.** Massachusetts Agric. Exp. Sta. Bull. 213. 1-22. 1 fig. 1923.—This bulletin reports the results of work continued after that reported in Bull. 203. Results of the 1922 experiments and observations on control are summarized in this bulletin. The value of sterilization of seed, soil, sash and sideboards; spraying and dusting of plants in the beds; roguing of plants and removal of diseased leaves from the field are discussed and directions given for the application of these measures. This bulletin also discusses the overwintering of the wildfire bacteria and their dissemination during the summer.—P. J. Anderson.

5637. CLAYTON, E. E. **Second progress report of black rot (*Pseudomonas campestris*) investigations on Long Island: seed infection and seasonal development.** (Abstract.) Phytopathology 15: 48-49. 1925.

5638. FERDINANDSEN, C. **Bacterium maculicolum McCulloch paa europæisk Grund. [Bacterium maculicolum McCulloch on European ground.]** Nordisk Jordbrugsforskning 1923: 467-474. Pl. 1-3. 1923.—The occurrence of the bacteriosis described by Miss McCulloch on cauliflower (1911) had been noted in Denmark for several years, but was definitely investigated only in 1922, when it was found in cabbage seed fields and further on cabbage, cauliflower, brussels sprouts, savoy, and on pointed and red cabbage, but not on kale. Isolated cultures proved the bacterium to be identical with the bacterium described originally. In cauliflower leaves in the herbarium the bacterium has survived, maintaining its virulence for more than 9 months, and infecting young plants of different varieties of *Brassica*, even kale. In the field, older plants of different varieties (except kale) could be infected by atomizer inoculation with pure cultures in bouillon.—Ernst Gram.

5639. GAUMANN, ERNST. **Onderzoekingen over de bloedziekte der Bananen op Celebes 1. [Investigations on the blood-disease of bananas in Celebes 1.]** (English summary.) Mededeel. Inst. Plantenziek. 50. 1-47. Pl. 1-7. 1921.—There are 2 banana diseases commonly present in the Celebes: (1) the Javanese vascular disease, generally distributed through the Dutch East Indies and causing no serious damage and (2) the blood disease which is limited to the Celebes. The characteristic symptoms of the blood disease can be separated into 2 groups, those involving the leaf crown and those involving the fructification. The leaf crown shows infection usually only after the fruit stem comes out. One of the younger leaves begins to show discoloration without any other noticeable change. Light yellowish brown stripes spread out from the midrib, in some cases extending to the margin of the leaf. Sometimes the fruit are nearly developed with not more than 1 leaf showing the yellow striping; then suddenly the entire plant succumbs. Within a week the entire leaf crown turns yellow, and the more or

less green fruit stalk hangs down out of yellow or partly brown leaves. Sooner or later the discolored leaves break down. In the fruit the disease symptoms develop rather late, commonly as they enter on the ripening process; they become yellow and brown, sag down and decay. In the rhizomes and the stem, the changes resemble those of the Javanese vascular disease. The name "blood disease" is given by the natives because of the fact that the slime exuding from the cut stem is often discolored, as occurs also in severe cases of the Javanese disease.—The changes in the fruit, however, are specific. First there occurs a yellow or brown discoloration of the central vascular bundles, which extends into the placentae and parenchyma and even the bundles of the fruit rind; the diseased cells contain bacteria. The fruit then droop and decay.—A comparison is given of the symptoms of the Javanese disease and of the blood disease. In contrast with the former, the changes in the leaf crown seem to be mainly of the physiological type and can not be entirely explained on the basis of the anatomical effects. The bacterial organism penetrates the fruit from the rhizomes. It is also found in old rotted rhizomes and in the soil. The cultural characters will be given in a later paper. Infection may occur either through the soil or by diseased propagating stock. Bacteria applied to the stigma during the period of fertilization reach the fruit through the style canal, a phenomenon which occurs in nature as well as experimentally.—Active control measures include the grubbing out of diseased plants and the rational use of fertilizers. Until the results of control experiments are available it is asked that the export of propagation stock and of fruit from the diseased region be stopped.—*Lillian C. Cash.*

5640. JONES, L. R., H. H. MCKINNEY AND H. FELLOWS. **The influence of soil temperature on potato scab.** Wisconsin Agric. Exp. Sta. Res. Bull. 53. 1-35. 5 pl., 9 fig. 1922.—Temperature variations evidently influence the development of common scab caused by *Actinomyces scabies* (Thaxter) Güssow. Five series of greenhouse experiments are reported where temperature was controlled by the "Wisconsin soil temperature tank" method. Seven gradations of temperature were used ranging from about 11 to 30°C. with about 3° intervals. The optimum temperature for scab development as measured by numbers of tubers scabbed was about 23°; as measured by relative area of surface scabbed, it was a little lower. The conclusion is that about 22°C. soil temperature may be termed the disease optimum when this method is used. Similar conclusions were reached by field trials using quite different methods. Limited field data as to occurrence and geographic distribution are in general accord with these conclusions. The explanation, dealing with possible influence of temperature upon each parasite and host are discussed, the conclusion being that the influence on host may be the more important, as predisposing to the disease.—*R. E. Vaughan.*

5641. LEACH, J. G. **The seed-corn maggot and potato blackleg.** Science 61: 120. 1925.—Evidence has been obtained to show that the seed-corn maggot, *Phorbia fusciceps*, is an important agent in disseminating and inoculating potato blackleg (*Bacillus phytophthorus*) in Minnesota. The pathogen is transmitted by the insect laying eggs on exposed disinfected seed tubers, or by the larva entering the tuber from the soil in which it has hibernated.—*C. J. Lyon.*

5642. LEVIN, ISAAC, AND MICHAEL LEVINE. **Malignancy of the crown-gall and its analogy to animal cancer.** Jour. Cancer Res. 5: 243-260. Fig. 1-15. 1920.—The authors state that crown-gall is a neoplastic disease which offers an ideal material for the cytological study of cancer and that it occurs both as a benign and a malignant condition. They believe that benign crown-gall is analogous to granuloma or cheloid in man and is due to *Bacterium tumefaciens*, and that the malignant crown-gall is analogous to human cancer but that in the latter case *Bacterium tumefaciens* is not the direct cause. They base the last claim on the fact that "When two plants of the same size, the same age, growing in the same soil under identical conditions of heat, light, moisture and nutrition, are inoculated in the same regions with the same quantity of an identical culture of *Bacterium tumefaciens*, and there develops in one plant a small, benign, wart-like structure and in the other a large malignant tumor which may destroy the plant, it is difficult to conceive that the same microorganism, and only the microorganism, created the two conditions . . . the transformation of this protective or inflammatory benign cell proliferation into a malignant tumor is due . . . to some mechanism within the organism of the host, independent of the microorganisms, the nature of which is unknown." (See also this issue, Entry 5649).—*Frederick V. Rand.*

5643. NAKATA, KAKUGORÔ, AND SEITÔ TAKIMOTO. **Bacterial disease of Hibiscus.** (Japanese.) Ann. Phytopathol. Soc. Japan 15: 13-19. 1923.—Since 1913, an undescribed bacterial leaf spot of *Hibiscus* has been under observation in Korea. The most noticeable lesions in leaves are found as irregular black spots which cause their distortion. The causal bacterium has been isolated repeatedly and its pathogenicity proved by inoculation with pure cultures. The disease is briefly described as follows: The disease affects the cotyledons and especially the young leaves when 2-3 leaves are expanded, but causes less injury when the plants are mature. The 1st signs of the disease are minute, circular, black spots which enlarge gradually and take circular or irregular outlines; finally their margins become angular, being limited by the veins. The outer parts of the spots take an obscure whitish yellow color or water-soaked appearance, and when the leaves are severely attacked the whole plant becomes blackened and dries out.—The causal organism, *Bacterium Hibisci* n. sp., is a cylindrical rod with rounded ends, single or usually in pairs, but frequently in chains, $1.2-2.0 \times 0.6-0.7\mu$, motile by means of 1-2 polar flagella, no spore or capsule formed; gram negative, stains well with carbol fuchsin, anilin water gentian violet, and aqueous methylene blue; on agar plates, the surface colonies are smooth and circular with entire margin, slightly elevated in the center, wet shining, finely granular in the center under magnification; bouillon culture clouded after 20 hours at 25-27°C., and rim produced with heavy precipitate; gelatin slightly liquefied, milk slowly peptonized, no gas produced, nitrate slightly reduced, no reaction of indol, thermal death point 49°C., aerobic.—Inoculation by needle puncture with water suspension of 24-hour agar cultures resulted in characteristic leaf spots, but inoculation by spraying failed to give infections. When seed soaked in a water-suspension of agar cultures are sowed, the germinating young plants show lesions of bacterial blight on the cotyledons.—Our experiment shows that this organism overwinters on seed. In April 1921, the seed were disinfected for 10 minutes with mercuric chloride (1 to 1000) or hot water (55°C.) and then sowed in large tubes with sterilized sand. The plants germinated were healthy and no disease was observed, but the plants from untreated seed showed 50% diseased leaves.—The experiments for control during the season of 1919 and 1920 show that seed disinfection is very effective, application of 5-5-50 Bordeaux mixture spray greatly reducing the disease.—Authors. (Courtesy Japanese Jour. Bot.)

5644. PELTIER, GEORGE L. **Present status of citrus canker problem.** Amer. Fruit Grower 44¹¹: 5, 19. 4 fig. 1924.—The history and cause of citrus canker are discussed, as are also the eradication campaign conducted against this disease and the present status of infection in the Gulf Coast States. The eradication campaign conducted in these states has proved very successful and the cost is believed to have been more than realized through the increased stability of the citrus industry as a whole throughout the country. Moreover, in the search for varieties and hybrids resistant to canker, several promising fruit which may have commercial possibilities, have been found.—Arthur S. Rhoads.

5645. RAJAN, D. MARUDA. **A new remedy for the potato ring disease.** Jour. Madras Agric. Students Union 12: 281-284. 1924.—Previous attempts to destroy mycelium of *Phytophthora infestans* in seed potatoes by exposure to dry heat are reviewed. E. F. Smith found the thermal death point of *Bacillus solanacearum*, which causes the brown-ring disease, to be 52°C. in 10 minutes. It was experimentally demonstrated that potatoes could withstand 4 hours' exposure at 53° without impairment of germination, whereas 55° injured, and 60° destroyed their vitality. Tubers infected with the brown-ring disease were treated for 4 hours at 53° and subsequently gave a crop free from the disease.—F. Weiss.

5646. RIKER, A. J. **Cytological studies of crown gall tissue.** (Abstract.) Phytopathology 15: 48. 1925.

5647. RIKER, A. J. **The influence of temperature and of previous infection on the development of crown gall.** (Abstract.) Phytopathology 15: 45. 1925.—No agglutinins or precipitins were found in plants bearing large crown galls.—B. B. Higgins.

5648. SCH. **Erkrankung der Ulmen.** [Diseases of elms.] Deutsch. Forstzeitg. 40: 37. 1925.—In the Rhineland and some other parts of Germany many of the elms are dying. Microscopic examination reveals no organism on leaves, stem, or roots, but in the outer 3 or 4 annual layers of wood are numerous dark specks in which bacteria have been identified by A. Brussoff

as *Micrococcus ulmi*. Inoculation of healthy elms with pure cultures of these bacteria produces all the symptoms of the disease. It is thought that the bacteria secrete a toxic substance which stimulates the growth of parenchyma cells surrounding the vessels, thereby choking the flow of sap.—*W. N. Sparhawk*.

5649. SMITH, ERWIN F. **Crown-gall and its analogy to cancer. A reply.** Jour. Cancer Res. 8: 234-239. 1924.—This is a criticism of a paper by Isaac Levin, and Michael Levine (see this issue, Entry 5642). Among other points discussed the author refers to the statement of Levin and Levine that "When two plants of the same size, the same age, etc. . . . are inoculated . . . and there develops in one plant a small benign wart-like structure and in the other a large malignant tumor . . . it is difficult to conceive that the same microorganism, and only the microorganism, created the two conditions." Smith states that "No two host organisms are exactly alike . . . and when the inoculated animal or plant does not contract the disease, if the inoculum is virulent and if it is administered in the right way, then we have to admit that the host is stronger than the parasite. But this does not compel us to believe that the parasite is not the cause of the disease, but only that in certain cases the host has the advantage and resists it . . . we might say of any parasite: It is not the cause of the disease, except through the failure of some unknown bodily condition to ward it off, and this is true, although it leads nowhere."—*Frederick V. Rand*.

5650. WOLF, FREDERICK A. **Bacterial pustule of soybean.** Jour. Agric. Res. 29: 57-68. Pl. 1-3, fig. 1-4. 1924.—This paper contains an account of a leafspot disease of soybeans called bacterial pustule, as it occurs in North Carolina. This disease has been reported from Texas, Arizona, South Carolina, Virginia and Kansas. It appears to be distinct from bacterial blight caused by *Bacterium glycineum* and *Bact. sojae* and from other bacterial diseases of this crop in the Orient.—Bacterial pustule is caused by *Bact. phaseoli* var. *sojense*, an organism which is morphologically indistinguishable from the well-known bean blight organism.—The disease appears to be confined to the foliage. Infection takes place through the stomates and the pustules arise by hypertrophy of the parenchyma tissues.—*Author*.

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

5651. ANONYMOUS. **The nematode disease of wheat caused by *Tylenchus tritici*, Steinbuch (Bastian).** Ministry Agric. Egypt Bot. Sect. Mycol. Div. 4. 1-3. Pl. 1-5. 1924.—This disease is of world-wide distribution; it is wide-spread in Egypt, occurring on both hindi and baladi wheats. As a rule the young leaf blades become twisted and rolled, lose their normal green color, become yellow, wilt and die. The stem may also be distorted and the entire plant dwarfed and yellowed. Diseased spikes are reduced in size, remain green longer and mature later than healthy heads and some of the flowering glumes bear small irregularly shaped galls in place of the normal grains. The life history of the nematodes is given. The disease is spread chiefly by the small galls which are harvested with the sound wheat. Control measures consist in the selection of clean seed and in crop rotation.—*Lillian C. Cash*.

5652. ARMITAGE, H. M. **A practical method of liberating parasites of black scale in the field.** California Citrograph 6: 272. Fig. 1-3. 1921.—The parasite, *Aphyus lounsburyi*, is being reared as described in an earlier article (see Bot. Absts. 14, Entry 3717), except that the potatoes are grown in small bottomless tar-paper pots. After the potato sprouts have been properly infested, but before the parasites emerge, the individual pots are planted under scale-infested orchard trees so that the parasites may transfer themselves directly to the trees. From 100 to 1000 individuals usually emerge from each infested potato.—*C. S. Pomeroy*.

5653. ARMITAGE, H. M. **Applied biological control with reference to black scale work in Southern California.** California Citrograph 6: 372, 398. 1921.—This summarizes the present status of the subject. The importance of controlled quantity production of natural enemies which shall be liberated with due regard to the seasonal development of both the predator and its host, is especially stressed.—*C. S. Pomeroy*.

5654. ELLIS, E. T. **Insect pests.** 156 p. George Allen & Union, Ltd.: London, 1924.—The pests of vegetables, fruits, flowers and forest trees are briefly described and curative measures given.—*Lillian C. Cash*.

5655. FAHMY, TEWFIK. **A banana disease caused by a species of *Heterodera*.** Ministry Agric. Egypt. Tech. and Sci. Serv. Bull. (Bot. Sect.) 30. 1-11. Fig. 1-10. 1924.—The history and occurrence of the disease are briefly given. Of 70 plantations examined in Upper Egypt none was found entirely free from disease, although in all provinces south of Asyut it was not serious enough to be an economic factor. North of Asyut some plantations were rendered worthless. In Lower Egypt the unsuitable soil and climate enabled the disease to make serious inroads and in the Alexandria district it was present in varying degrees of severity. The diseased plant is dwarfed, its leaves being small and upright, forming a miniature rosette. The crowded growth causes the pseudostem to split open, while the plant remains as if paralyzed until some injury or the increasing invasion of the parasite causes rot to set in. On careful examination, the roots show the following characters: some are rotten, some bear galls or swellings, while others are healthy. All show numerous dark dots where rootlets once took their origin. Some of the roots are knotted or bear galls within which small round bodies are imbedded. The parasite is described in detail. Infected suckers are suspected to be the source of infection; no sucker plantation examined was found to be absolutely healthy. The disease was shown experimentally to be spread by infected soil and from diseased to adjacent healthy banana plants. Soil sterilization is considered the most feasible means of control, although its practical application has not been thoroughly tested.—*Lillian C. Cash.*

5656. GÉZE, J. B. **Sur quelques cécidies trouvées pendant la Session.** [Some cecidia found during the session.] Bull. Soc. Bot. France 71: 861-862. 1924.—The author notes the following cecidia found during the session of the Société Botanique de France in the Central Pyrenees, in 1924: *Tetraneura ulmi* on *Ulmus montana*, *Phyllocoptes minutus* on *Asperula cynanchica*, and *Andricus fecundatrix* Hartig on *Quercus pedunculata* L.—*J. Beawerie.*

5657. HODGSON, ROBERT W. **Saving the gophered tree.** California Citrograph 6: 352-353. 2 fig. 1921.—If gopher injury is discovered soon after it has occurred recovery of the trees will usually take place if the injured area is thoroughly cleansed and painted with warm grafting wax or a pure asphaltum to prevent the drying of the remaining cambium cells. It appears desirable to cut back the tree tops somewhat to restore the balance between the top and root system. Where the injuries are not discovered for several months, it will usually be found necessary to resort to bridge grafting, if healthy bark still exists below the injured area, or to inarching, if the bark on the lower part of the trunks or roots is dead.—*C. S. Pomeroy.*

5658. MARCOVITCH, S. **Promising plant insecticides.** Science 61: 22. 1925.—Sodium fluosilicate has proved effective both as a contact and stomach poison in the case of the Mexican bean beetle (*Epilachna corrupta* Muls.). In an undiluted form it is effective against the cotton boll weevil (*Anthonomus grandis* Boh.). Mustard gas plus a little ether adsorbed on powdered charcoal, and liquid nitrobenzene killed Mexican bean beetles. The weevil is slowly killed by the impregnated charcoal powder.—*C. J. Lyon.*

5659. MOESZ, G. **Gombaokozta gubacsok.** [Phytocecidia.] Természettudományi Köz-
lönyhöz [Budapest] 56: 20-31. Fig. 1-4. 1924.

5660. PRIZER, J. A. **Fumigation versus spraying.** California Citrograph 6: 233, 250-251, 268. 1921.—This is a discussion based on careful commercial work in a large successful citrus orchard, for the control of citricola scale and citrus thrips in Tulare County. Satisfactory control of the scale in light infestations was secured by spraying, but at a higher cost than for fumigation, though a certain amount of thrips control was also secured by the spray. Fumigation is deemed the most desirable practice in general, as it usually fits in best with other orchard work and is cheaper, and is the only effective control for heavy scale infestations.—*C. S. Pomeroy.*

5661. VAN SOMEREN, V. J. L., AND J. W. HUNT. **Notes on the life history of the black rose chafer (*Diplognatha silacea* MacL.).** Jour. East Africa and Uganda Nat. Hist. Soc. 19: 3-6. 1 pl. 1924.—This insect is of economic importance and is the commonest rose beetle around Nairobi.—*Wm. Randolph Taylor.*

5662. STEINER, G. **On some plant parasitic nemas and related forms.** Jour. Agric. Res. 28: 1059-1066. Pl. 1-4. 1924.—*Cephalobus subelongatus* Cobb, a nema perhaps identical with the European *Cephalobus elongatus* de Man, was found parasitic in the stems and leaves

of *Phlox*; alfalfa and other plants are also mentioned as hosts. A complete description of the species is given.—*Kigelia pinnata*, the African Sausage tree, is mentioned as a host of *Heterodera radiculicola* (root knot nematode).—*Aphelenchus ritzema-bosi* was found in *Phlox drummondii* and in chrysanthemums in Washington, D. C. and Chestertown, Maryland. Details of its morphology, reviviscence and synonymy are given.—*Dorylaimus regius*, belonging to a soil nematode family whose members are numerous everywhere, is stated to feed on soil Oligochaetes; other *Dorylaimus* species, however, may be plant feeders. A number of morphological features are added.—*Paratylenchus nanus* Cobb in rather large numbers were found in roots of *Zinnia elegans* from Chestertown, Maryland, causing a brown discoloration of the roots. The species is apparently syngonic (hermaphroditic or parthenogenetic).—*Author*.

5663. WOGLUM, R. S. **Control of red spider.** California Citrograph 6: 273, 304. 1 fig. 1921.—This is a résumé of practices in use by the most successful growers under different climatic conditions. Control by parasites is effective some seasons, particularly in humid coastal locations, but the spray outfit should be ready for use if the spiders become abundant. Conditions requiring spraying are indicated, liquid lime-sulphur being the preferred material, generally at a 2% strength.—*C. S. Pomeroy*.

5664. WOGLUM, R. S. **Is scale becoming resistant?** California Citrograph 10: 178. 1925.—This includes a discussion of the increased resistance to control by fumigation that has become apparent in the red and black scales on citrus trees in certain areas in southern California during the past few years. Fumigation dosages are now frequently twice as strong as formerly and with less satisfactory results. The most effective control is fumigation with heavy dosages, while for the resistant black scale a spray program or a combination of spraying and fumigation seems to offer a probable solution.—*C. S. Pomeroy*.

5665. ZIMMERLY, H. H., AND HERBERT SPENCER. **Hot water treatment for nematode control.** Virginia Truck Exp. Sta. Bull. 43. 267-278. 6 fig. 1923.—Experiments over a 10-year period to test methods of controlling the garden nematode (*Heterodera radiculicola*) in greenhouse soils, where steam sterilization was not possible, are reported. Even under favorable conditions, CH_3O , CaCN , NaCN and CS_2 were not effective, even though used in large amounts. Application of boiling water during midsummer at the rate of 5 gallons per cu. foot of soil destroyed all nematodes in greenhouse and coldframe soils. Canvas covers placed over the treated soil immediately after application of the water were helpful. Soil temperatures for treated soils are given.—*J. T. Rosa*.

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

5666. COOK, MEL T. **Studies on the cytology of sugar cane mosaic.** (Abstract.) Phytopathology 15: 45. 1925.

5667. DUCOMET, V. **Dégénérescence de la Pomme de terre et degré de maturation du tubercule semence.** [Degeneration diseases of the Irish potato as influenced by maturation of tubers.] Rev. Path. Vég. et Entomol. Agric. 11: 183-188. 1924.—Plants grown from sound tubers were the less vigorous the earlier the tubers were cropped. However, the percentage of plants affected by leaf roll proved to be higher in the progeny of tubers which had been cropped late in the season of the year before.—*J. Dufrenoy*.

5668. EDGERTON, C. W. **Selecting for resistance to sugar cane mosaic.** (Abstract.) Phytopathology 15: 45-46. 1925.

5669. GRAM, E. **Mosaiksyge i Drivhuse.** [Mosaic in greenhouses.] Gart. Tidende 40: 189-193, 209-213. 6 fig., 1 diagr. 1924.—The types of mosaic occurring on Solanaceae and Cucurbitaceae in greenhouses are noted.—*Author*.

5670. GRAM, E. **Mosaiksyge i Rodfrugterne.** [Mosaic in root crops.] Vort Landbrug 43: 181-184. 1924.—Mosaic of fodder and sugar beets was found in Denmark in 1903 and has later been noted from 157 localities. Fertile soil, large space and hedges between the 1st and 2nd year beet crops, roguing in the field and at the pits, and control of aphids and other insect carriers, tend to diminish the attacks. Resistant varieties are not known. Mosaic of crucifers is found in Denmark on turnip and related garden roots in only 6 localities, distant from one another. It appears to be extremely contagious, being transmitted by merely touching.—*Author*.

5671. JOHNSON, JAMES. A virus from potato transmissible to tobacco. (Abstract.) *Phytopathology* 15: 46-47. 1925.

5672. McCUBBIN, W. A. Peach yellows and little peach. Pennsylvania Dept. Agric. Gen. Bull. 382. 1-16. Fig. 1-2. 1924.—This is a popular article giving a description of the diseases, other troubles likely to be confused with them, a discussion of the means of transmission and notes on control.—*Lillian C. Cash*.

5673. MURPHY, PAUL. Virus diseases of plants. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 492. [1924].

5674. OLITSKY, PETER K. Experiments on the cultivation of the active agent of mosaic disease of tobacco and tomato. *Science* 60: 593-594. 1924.—By careful experiments it was shown that the incitant of mosaic disease of *Nicotiana tabacum* and *Lycopersicum esculentum* is a living microbic body which can be cultivated in an artificial medium.—*C. J. Lyon*.

5675. QUANJER, H. M. So-called "virus diseases" of plants: their symptoms, causation, mode of dissemination, and economic importance from a physiological point of view. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 492-493. [1924].

5676. STOREY, H. H. A disease of maize and its probable relation to the control of streak disease in Uba cane. *South African Sugar Jour.* 8: 647, 649. 1924.—It has been discovered that the disease of maize usually called "variegation," but better known among sugar planters as streak disease, is carried by a small leaf hopper, a species of the genus *Balclutha*. This insect may frequently be found by looking down into the cone of the young leaves of the maize plant. At the least vibration it takes flight and may go some distance before coming to rest on another maize plant. Experiments at the Natal Herbarium proved that this insect, after feeding on a diseased plant, is capable of producing the disease in every maize plant upon which it subsequently feeds.—While no positive proof has been found of the identity of the streak diseases in maize and sugar cane, very strong indirect evidence points to their identity, and consequently the author recommends that no maize be grown in the vicinity of nursery plots and as far as possible none near cane, and further that the planting of mealies, particularly near the nursery plots, be stopped. The author further recommends the establishment of nursery plots as far distant as possible, preferably 1-2 miles, from any existing streaked cane and suggests the desirability of a barrier in the form of a gum-tree belt or river. All old stools must be ploughed out and it must be made sure that they are dead. In selecting cane, the tops should be seen while still unwilted, for once they are cut, diseased cane can not be distinguished with certainty from the healthy. In case cane is purchased, assurance should be had that the seller has carried out selection at the time of cutting. As soon as the cane is through the ground it should be examined row by row, as the disease shows plainly on young shoots; all sets showing diseased shoots should be dug out, the process to be repeated every month until no streak is found.—*Nellie E. Fealy*.

5677. TOMPKINS, C. M. Effect of intermittent temperatures on potato mosaic. (Abstract.) *Phytopathology* 15: 46. 1925.

PARASITIC PHANEROGAMS

5678. MAGNEL. Une acquisition pour la Flore belge. *Bull. Jard. Bot. Etat Bruxelles* 101: 58. 1924.—The presence of *Orobanche major* L. and perhaps also of *O. gracilis* on *Centaurea scabiosa* at Torgny, is reported.—*E. De Wildeman*.

5679. MUENSCHER, W. C. *Orobanche ramosa* on a *Coleus*. *Rhodora* 26: 133-135. Pl. 145. 1924.—The Eurasian *Orobanche ramosa* L., a species introduced into North America where it has been known as a parasite on hemp, tobacco and tomato, is proving a menacing weed on *Coleus* in greenhouses at Flushing, Long Island, U. S. A. It has been recorded on *Coleus* abroad but apparently not previously in this country.—*M. L. Fernald*.

NON-PARASITIC DISEASES

5680. ANONYMOUS. Albino redwood shoots. *Missouri Bot. Gard. Bull.* 11: 90-92. Pl. 24. 1923.—A piece of redwood burl, placed in a bowl of water, developed a number of albino shoots.—*O. T. Wilson*.

5681. ANONYMOUS. **Expansion of the garden.** Missouri Bot. Gard. Bull. 11: 29-33. 1923.—The necessity of growing plants away from the smoke-laden atmosphere of the city is explained by a summary of the toxic effects of smoke upon plant growth.—*O. T. Wilson.*

5682. ÅKERMAN, Å. **Iakttagelser rörande olika havresorters motståndskraft mot grå-fläcksjuka.** [Observations on resistance of oat varieties to dry speck disease.] Nordisk Jordbrugsforskning 1923: 49-61. 1923.—In 1908 Nilsson-Ehle and Rhodin published observations on resistance towards dry-speck (Dörrfleckkrankheit), a disease connected with certain soil conditions and aggravated by drought. Since then more than 50 oat varieties have been tried on the dry-speck soil. The varieties Fyris, Perle, Melog, and 2 black-kernel varieties from Luleå were very resistant, and Mesdag and German Moor were relatively resistant. Of the Probsteier types, Næsgaard and Strubes Schlanstedt were relatively resistant; Seger, Kron, Abed Nova, and Weibull Fortuna, a little less so. Still more susceptible were Guldregn, Ligowo II, Grenader, Odin, Thor, and v. Lochows Gelbhafer. Black tartarian plume and Improved Dala were most damaged. The resistance towards dry speck is apparently connected with several factors which may be accumulated.—*Ernst Gram.*

5683. BIRMINGHAM, W. A. **An uncommon watercore condition in apples.** Agric. Gaz. New South Wales 36: 59-62. 2 fig. 1925.—Conditions probably influencing watercore in these King David apples were: susceptibility of the variety, excessive rainfall previous to picking, an advanced stage of maturity of the fruit when picked, and severe pruning of trees for 2 years previous to the appearance of trouble. In general, factors affecting transpiration are of prime importance in inducing watercore. Control methods suggested are adequate provision for drainage, control of fungus and insect pests causing defoliation, light pruning of susceptible varieties, and reasonable application of water in irrigated districts.—*L. R. Waldron.*

5684. DIEHL, H. C., AND R. C. WRIGHT. **Freezing injury of apples.** Jour. Agric. Res. 29: 99-127. Pl. 1-5, fig. 1-12. 1924.—Freezing point temperatures of a number of varieties of apples were determined. The average freezing point of all varieties, both eastern and western grown, was 28.5°F., the maximum 29.4°F., and the minimum 27.8°F. Cooling apples below their freezing points without the formation of ice in the tissues did not cause any visual injury or perceptible softening of the fruit. Under-cooling of isolated apples could sometimes be carried to a point as low as 7 or 8°F. below their freezing points without ice formation, providing the fruit was undisturbed. Inoculation or the beginning of ice formation took place rather slowly at times. The bruising of apples while they were hard-frozen resulted in a much more serious injury than did a similar bruise on unfrozen fruit. The severity of the injury caused by bruising frozen apples was lessened as the amount of ice in the tissues decreased during thawing. Bruises made on apples before they were frozen did not become more serious as to depth when the fruit was frozen. There were no significant differences in the depth or character of bruises on hard-frozen apples when subjected to different thawing temperatures. Visible freezing injury may be classed under 2 heads, that appearing in the tissues of the apple, and that appearing on the surface, both being found in the same apple or occurring independently. Visible freezing injury exhibited a great variety of forms and intensities, which depended not only on the severity and duration of the prevailing freezing temperatures, but also on other factors, such as the physiological condition of the fruit. The point to which the internal temperature of an apple was reduced before visible injury occurred varied with the variety, and with the individual apple. Under conditions of moderate thawing rates and rather short exposures to freezing conditions, it was found that the interiors of apples usually had to reach a point at least 2-3°F. below the actual freezing point after ice formation had started, before visible injury occurred. The data on the rate of cooling of different packages exposed to freezing temperatures emphasized the fact that apples could be exposed in such packages for considerable periods of time without the occurrence of any considerable actual freezing. Apples in the lower part of packages held under freezing conditions were exposed to a greater danger of freezing injury than those in any other portion of the package. Wrapping the fruit served to hinder the loss of heat from the fruit under freezing conditions, thereby delaying the formation of ice in the tissues. Repeated freezing and thawing of apples caused a progressive increase in the freezing injury. There was no evidence of a progressive and

sustained raising of the freezing point of apples held at 32°F. during the storage season. The temperatures at which apples are ordinarily thawed had only a slight effect upon the subsequent condition of the fruit, but very high temperatures and low humidities are not recommended. There was a distinct weakening in the keeping quality of apples when they were frozen, even when there was no visible evidence that freezing had occurred. The tissues of frozen apples were softer after thawing, as measured with the pressure tester, and in a poorer condition to withstand storage and marketing, even though no direct discoloration had occurred. The degree of this softening varied with the time of exposure and the intensity of the freezing temperature.—*H. C. Diehl.*

5685. JONES, L. R., M. MILLER, AND E. BAILEY. **Frost necrosis of potato tubers.** Wisconsin Agric. Exp. Sta. Res. Bull. 46. 1-46. 1 col. pl., 12 fig. 1919.—Frost necrosis found in field or storage is compared with that produced experimentally. Simple apparatus and complex Potter apparatus for controlling freezing temperatures are figured and explained. The liability to frost necrosis and type of resultant injury was not apparently influenced by tuber variety, size, turgidity or maturity. Frost necrosis may appear in 3 types: (1) Net type—blackening of the finer vascular elements; (2) ring type—a more pronounced blackening of tissue in and near the vascular ring; and (3) blotch type—less well defined, varying from opaque grey to sooty black. Frost necrosis is contrasted with: (1) Dry rot produced by *P. infestans*; (2) wet rot associated with bacteria; (3) ring necrosis, non-parasitic or associated with *Fusarium* invasion; (4) brown rot produced by *B. solanacearum*; (5) net necrosis, non-parasitic; (6) black heart, due to high temperature; and (7) internal brown spot, non-parasitic.—Symptoms of frost necrosis commence to show when tubers are held at -2.5 to -3.2°C. for 12 hours or more, the blotch type being most common. The greatest amount of the net type occurs with short exposures of -5 to -5.6°C. The blotch type again predominates at -6 to -8°C. Potatoes freeze solid at -10°C. or below, if exposed for any considerable time. The actual freezing point of potato sap is about -1°C., but precooling to about -3°C. is necessary to start ice crystal formation. Sprouts are more resistant to freezing than the tubers. Necrotic symptoms never appear in the progeny of frost necrotic seed potatoes.—*R. E. Vaughan.*

5686. KIDD, FRANKLIN, AND CYRIL WEST. **Functional diseases of apples in cold storage.** Internat. Rev. Sci. and Pract. Agric. N.S. 2: 594-603. Pl. 37-48, fig. 76-95. 1924.—This is a summary of the present knowledge of the causes and control measures of functional diseases of the apple, to which is added a series of illustrations to aid in their identification. The authors call attention to the fact that it is unfortunate that the classification of these diseases has been based entirely upon appearance and distribution of the affected tissues, rather than upon causal conditions. The diseases discussed include: (1) Scald and "spotting," characterized by browning of the superficial cells of the fruit unaccompanied by softening or browning of the flesh, and controlled to some extent by efficient ventilation and very largely by the use of oiled wrappers; (2) internal breakdown, a term used to include "internal browning," "soft scald," "flesh collapse," "Jonathan scald," and "physiological decay," all brought about by low temperatures causing premature browning of the flesh, with or without mealiness; (3) brown heart, a premature browning of the flesh with the tissues killed and collapsed, and due to a concentration of carbon dioxide above a certain limit, which may be avoided by proper ventilation; and (4) frost injury, producing water-logged tissues either in the vascular region or in the flesh.—*Wanda Weniger.*

5687. ROBERTS, R. H. **The development and winter injury of cherry blossom buds.** Wisconsin Agric. Exp. Sta. Res. Bull. 52. 1-24. Pl. 1-4, fig. 1-7. 1922.—Winter killing of the sour cherry (*Prunus Cerasus*) varieties, Early Richmond and Montmorency, may occur locally in Wisconsin but is not as general as on sweet cherry (*Prunus avium*), which is not commercially profitable. Under Wisconsin conditions cherry blossom-buds are differentiated early in July. The rate of subsequent development rather than the time of differentiation controls the amount of bud development before the winter season. The buds which have the most advanced development usually show the highest degree of freezing injury which under Wisconsin conditions usually occurs during the low temperatures of December and January. In general, injury does not occur until the temperature reaches -10°F. or lower. The region of

fatal injury is the pith of the blossom pedicel. Injury is also common in the epidermis or 1st layer of hypodermis of the calyx, and in sepals and petals and at the base of the pistil. The vascular strands are notably free from injury. Injured cells are discolored without apparent rupturing of the cell walls. Following injury the surrounding tissue may become shriveled. The presence of a large central vacuole in the cytoplasm was constantly associated with injury. No injury was observed in cells having a uniformly dense cytoplasm.—*R. E. Vaughan.*

5688. SHARPLES, A., AND J. LAMBOURNE. **Field experiments relating to brown bast disease of *Hevea braziliensis*.** *Malayan Agric. Jour.* 12: 290-343. 1924.—Details are given of prolonged tapping experiments; these indicate that brown bast is a "physiological" disease. It is shown that over-extraction of latex is the most important factor in initiating brown bast; no definite correlations have been established with rainfall or other factors.—*R. E. Holtum.*

5689. SHULL, J. MARION. **Frost injury in *Iris* and *Diervilla*.** *Jour. Heredity* 15: 29-32. *Fig. 16-18.* 1924.—An investigation of the effects of frost on *Diervilla coraensis* and *Iris trojana* showed that the iris inflorescence may be divided into several distinct zones with reference to cold-sensitiveness, the most advanced buds probably being the 1st to suffer, whereas the most backward buds may retain the power to develop. In *Diervilla*, frost did not kill the corolla, but completely arrested its growth, while stamens and pistils continued to develop practically as in the unhurt flowers which developed from the more backward buds.—*H. Cook.*

5690. STOKLEY, CHARLES L. **Frost and frost protection.** *Florida Fruits and Flowers* 1*: 96-97, 112. 1924.—Frost and frost protection are discussed with reference to the banana industry of central and upper South Florida, where frost protection sometimes becomes very desirable for bananas. Only 2 methods of frost protection insurance are considered practical for fruit, including bananas, in Florida, namely, outright insurance and the use of grove heaters; both methods are discussed. Bananas offer greater opportunity than *Citrus* for heater protection upon a much more assured basis, both as to security and economy.—*Arthur S. Rhoads.*

DISEASE OF UNKNOWN CAUSE

5691. BIRMINGHAM, W. A. **Disease of *Pinus insignis* at Strickland State Forest, Narare.** *Australian Forest. Jour.* 5: 206-211. 5 *fig.* 1922.—The abnormal conditions here reported comprise (1) fusion of needles; (2) profuse development of needles along the axis; (3) a long main axis free from lateral growth and with mop-like head; and (4) plants with development of laterals followed by abnormally long main axial growth without indication of further lateral development.—Basing his opinion on experimental results, the author states that neither *Sphaeropsis* sp. nor *Pestalozzia* sp. found on the affected plants, are responsible for the diseased condition. He concludes that the 4 distinct types of abnormal growth, in the absence of any causal organism, point to the cause as physiological, and thinks that climatic and soil conditions may possibly be responsible to some extent for the unfavorable growth in this district. (The reference to *Pestalozzia* and *Sphaeropsis* in *Bot. Absts.* 12, Entry 4429, belongs here rather than in the paper by GEOFFREY SAMMUEL.)—*Frederick V. Rand.*

5692. HESSELINK, E. **Enkele opmerkingen naar aanleiding van de "Iepenziekte."** [Some remarks about the *Ulmus* disease.] *Landbouwk. Tijdschr.* 36: 446-448. 1924.—It is stated by some Dutch investigators that the cause of the elm disease is not known, whereas others state that it is a fungus. Recently it has been advised to plant elms with the view of obtaining disease-resistant individuals. The writer states that selection in this direction is not possible, referring to cases where the mother plants were immune but the progeny was susceptible.—*J. C. Th. Uphof.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

5693. ANONYMOUS. **Precautions against disease.** *Australian Sugar Jour.* 16: 504-505. 1924.—As a warning against spreading diseases among sugar cane, attention is called to the statement of D. S. North that one of the special features of leaf scald and leaf stripe in sugar cane, in common with gumming, Fiji disease, and mosaic, is that a diseased set will always produce a diseased plant no matter how lightly affected the original set may be, and that

stools which to all appearances are healthy may be diseased and yield cuttings which will produce affected plants.—*Nellie E. Fealy.*

5694. ARMSTEAD, DOROTHY, AND S. C. HARLAND. **The destructive effect of micro-organisms on raw cotton and cotton fabrics. A summary of the literature.** (British Cotton Indust. Res. Assoc.) Jour. Text. Inst. 14: T 157-160. 1923.—The literature on cellulose destroying bacteria and fungi is briefly summarized and a list of 15 references is appended.—*Frederick V. Rand.*

5695. ARNAUD, G., ET M. ARNAUD. **Notes de pathologie végétale.** [Phytopathological notes.] Rev. Path. Vég. et Entomol. Agric. 11: 178-182. 1924.—A list is given of plant pests collected in southeastern France.—*J. Dufrenoy.*

5696. BOAS, FRIEDRICH. **Die wichtigsten Getreidekrankheiten.** [The most important cereal diseases.] 53 + 2 p. Fig. 1-17. F. P. Datterer & Cie (Sellier): Freising, 1923.—The author aims to disseminate in collected form the status of our information on cereal diseases and pests and their control. After an introductory statement as to the agricultural significance of these diseases and pests he goes on to a more detailed discussion, taking up in Part I the vegetable parasites, including the smut fungi (the group in which infection takes place at germination and that in which infection occurs in the blossoms, with data regarding cultural measures for control of smuts, and special disinfectants and contrivances for seed disinfection); stripe disease of barley; Fusarium diseases; ergot; mildew; rust fungi; and "Dörrfleck-enkrankheit," a nutrition disease.—In Part II animal pests are discussed, and a literature list of 8 entries is appended.—*Frederick V. Rand.*

5697. BOYCE, J. S. **Status of forest tree diseases on the Pacific Coast.** Timberman 26: 60. 1924.—Mistletoes were found to cause reductions in growth in western yellow pine in eastern Oregon, amounting to 36% in height and 17% in diameter for trees 100 years old; corresponding reductions in Douglas fir growth were 15 and 20%, and for western larch, 45 and 41% in height and diameter, respectively. Losses from wood-destroying fungi are estimated at 15% of the volume in western coniferous timber of merchantable size. Efforts should be directed towards utilization to the best advantage of present defective material and the future management of the forests on a sufficiently short rotation to avoid losses of economic importance. Native species should be protected by quarantine from introduced parasites such as chestnut blight, white pine blister rust, and Douglas fir canker which cause far greater damage than native parasites, even to the extent of complete elimination of some species from the stand.—*Duncan Dunning.*

5698. CLAYTON, E. E. **Second progress report on seed treatment for black leg (*Phoma lingam*) and black rot (*Pseudomonas campestris*) of cruciferous crops.** (Abstract.) Phytopathology 15: 49. 1925.

5699. COOKE, W. W. **Spraying vines with a spray gun.** Agric. Gaz. New South Wales 36: 65-67. 3 fig. 1925.—A description is given of an arrangement attached to a tractor spray outfit, whereby spray guns can be used in the treatment of vines.—*L. R. Waldron.*

5700. COTTRELL-DORMER, W. **Diseases of sugar cane.** Australian Sugar Jour. 16: 543, 545-546. 1924.—Clark's Seedling (H. Q. 426) was found most susceptible of the varieties of cane growing in the Herbert River district. In this district the more recently introduced varieties showing leaf scald were Nanemo, Arambo, and Korpi, susceptible in the order named, the damage to Nanemo being very serious. In the Moreton district, D. 1135 is the variety most affected with the gumming disease, and other varieties affected with this disease are Hambledon Seedling (H. Q. 285), Gingila, Malagache, and Q. 813, in the order named; next to Shahjahanpur 10, the variety showing most mosaic disease is M. 1900; and D. 1135 is also more or less affected.—*Nellie E. Fealy.*

5701. COTTRELL-DORMER, W. **Sugar cane diseases in the South.** Australian Sugar Jour. 16: 596-597, 604-605. 2 fig. 1924.—Mosaic was found to be the most prevalent infectious disease of cane in this section and Shahjahanpur No. 10 the variety most affected. Not only has this variety shown marked susceptibility, but the disease seems to spread more from it than from other varieties, the possible reason being that as mosaic depends for transmission, so far as known, on insects, they prefer this to other canes. Q. 813 is mentioned for this section as being resistant to mosaic.—Knife cut disease was found only on D. 1135, the staple cane in

this district.—An acute form of root disease, known locally as foot rot, was found. It appears to attack the lower roots first, gradually working upward, and eventually killing all the roots. After this, aerial roots are formed and find their way into the soil. In case the weather is favorable for their development the cane will survive but remain stunted, but if the weather is favorable to the disease it attacks these new roots and through them enters the stalk. Measures recommended for the control of this disease are (1) avoidance of infected material for planting; (2) removal of all stools when the cane is ploughed out in infected areas; (3) rotation of crops widely different from cane, such as legumes; and (4) frequent turning of the soil while it is being spelled to provide for sun sterilization.—In the Isis district a root disease similar to foot-rot was found on H.Q.458, Q.813, and D.1135, but more especially on M.1900 Seedling; in some places it is doing serious damage. In the affected plants the leaf sheaths of the young plant and ratoon cane are tightly bound by an abundant growth of the fungus in the spaces separating the leaf sheaths, this growth binding the bases of the leaves so tightly that they can not be separated without tearing. The result is that the growing point of the shoot is unable to extend further in an upward direction and swells laterally and bursts the binding leaves, often forming a great bulb-like projection on 1 side of the shoot. The methods above mentioned for the control of foot-rot are recommended for this disease.—Gumming disease was widely distributed in this district, but with the exception of a few fields, was doing little damage. Under a high-power microscope great numbers of *Bacillus vascularum*, the cause of the disease, are seen in the tissue of the broken yellow and red line.—*Nellie E. Fealy.*

5702. DAVIS, RAY J., HERBERT SPENCER, AND H. H. ZIMMERLEY. **Dusting and spraying tomatoes.** Virginia Truck Exp. Sta. Bull. 46. 317-327. 3 fig. 1924.—Tests were made in 1922 and 1923 to compare the relative efficiency of 16% monohydrated copper sulphate-lime dust and 4-6-50 Bordeaux mixture as a liquid spray. For each application 20 pounds of the dust and 75 gallons of the spray were required per acre while the plants were small, and double these amounts when the plants were full grown. Both dust and spray treatments resulted in considerable increases in yield, the increase being somewhat greater in the case of the dust. The increased production occurred mostly in the latter part of the season, yields of early fruit being about the same on sprayed, dusted and untreated plots. The diseases mentioned are leaf spot (*Septoria lycopersici*), leaf mold (*Cladosporium fulvum*) and wilt (*Fusarium lycopersici*). The principal insect pest is the tomato fruit worm (*Chloridea obsoleta*).—*J. T. Rosa.*

5703. DENHAM, HUMPHREY JOHN. **Preliminary note on the destruction of the cotton hair by micro-organisms.** (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 13: T 240-248. Pl. 1-3. 1922.—The modes of weakening of cotton fiber by molds and bacteria are briefly described and illustrated. No attempt is made to identify the organisms involved.—*Lillian C. Cash.*

5704. FAWCETT, HOWARD S. **Observations on bark diseases of Citrus in Sicily.** Phytopathology 15: 41-42. 1925.—While passing through Italy and Sicily during May, 1923, the author noted the occurrence of the following diseases of Citrus trees and fruits: Pythiocyctis gummosis (*Pythiocyctis citrophora* Sm. & Sm. or *Phytophthora terrestris* Sherb.), decorticosis (*Phomopsis californica*), citrus blast and black pit (*Pseudomonas citriputeale*) and psoriasis, cause unknown.—*B. B. Higgins.*

5705. FERDINANDSEN, C. **Kemiske Afsvampningsmidler.** [Chemical seed disinfectants.] Ugeskr. Landmaend 69: 109-112, 125-127. 1924.—The ideal seed disinfectant should be highly fungicidal, harmless to the germination of the seed, not too poisonous, easily soluble in water, protective against reinfection, of known constitution, and economical in use. The question whether the expensive mercury compounds, which otherwise seem promising, are more economical can only be solved by several years of field tests.—*Ernst Gram.*

5706. FERNALD, H. T., AND A. I. BOURNE. **Injury to foliage by arsenical sprays. I. The lead arsenates.** Massachusetts Agric. Exp. Sta. Bull. 207. 1-19. 23 fig. 1922.—This bulletin presents the results of 10 years' work by the authors. The most important conclusions are: (1) Injury results from the combinations of temperature, humidity and light factors. A high value for either of the first 2 factors, provided the other is low, indicates probable safety, particularly on sunny days. (2) Neutral lead arsenate is safest. (3) Injury is less in clear weather than in cloudy. (See also following entry).—*P. J. Anderson.*

5707. FERNALD, H. T., AND A. I. BOURNE. Injury to foliage by arsenical sprays. II. Calcium arsenates and arsenites. III. Notes on other arsenicals. Massachusetts Agric. Exp. Sta. Bull. 210. 89-98. 14 fig. 1922.—This bulletin presents further results of the work previously described (see preceding entry). With calcium arsenate the same factors determine injury as were found to be operative with lead arsenates, but the safety lines run lower. In general, lime arsenate was not found to be as satisfactory as lead arsenate. Calcium metarsenite, magnesium arsenate and zinc arsenite were not found to be safe on fruit tree foliage.—P. J. Anderson.

5708. FRANKLIN, H. J. Eighth report of the cranberry station. Massachusetts Agric. Exp. Sta. Bull. 206. 150-168. 1921.—This bulletin includes a study of cranberry varieties, yields, fungous diseases, insects, bog management, water injuries, weather effects, and also some results of work on blueberries. The "rosebloom" disease was partially controlled by flooding. Wisconsin false blossom was found in various places and was wiped out by destroying all the vines. Spraying with lead arsenate had an undesirable effect on the growth of the vines.—P. J. Anderson.

5709. GRAM, E. Tørfafsvampning af Vintersæden. [Dust disinfection of winter grains.] Vort Landbrug 43: 392-393. 1924.—The expectations seem to be justified that dusting should be practical because of the expediency, the dry state of the treated grain, and the larger preventive power against reinfection. The cost of the chemicals is higher than with sprinkling or immersion but will be counterbalanced by the convenience in the years when sowing follows closely upon harvest. For tests, the following chemicals are recommended, using 2 kg. of finely ground dust per ton of wheat or rye: copper carbonate, Uspulun, Germisan, and Tillantin B.—Author.

5710. HENNING, E. ET AL. [Internal inspection service for plant diseases and pests in the Scandinavian countries. Symposium of the phytopathological section in Gothenburg June 22nd, 1923.] Nordisk Jordbrugsforskning 1923: 437-450. 1923.—In Sweden, J. Eriksson proposed a special inspection service (1913) but it was determined rather to let the phytopathological and entomological departments of the Central Agricultural Institute be charged with a larger extension service.—In Finland, E. Reuter has collected much material and was the first to instigate experimental work. Lectureships in entomology and physiology were founded in 1896. These were transformed into professorships of agricultural and sylvan zoology and of plant biology and pathology in 1921. The lecturers were charged with experimental work at the agricultural station; a special inspection service is still lacking.—Norway has maintained a state entomologist since 1893, and in 1918 the charge of the diseases was transferred from him to a special state mycologist. Now the efforts are directed against an enlargement of the experimental service. Norway has a plant disease act, leaving to the Department of Agriculture all measures necessary to the limitation or extermination of dangerous diseases and pests. The act has been applied against potato wart, American gooseberry mildew, stem rust of grains, pear thrips, strawberry mites, oat aphids, and several other pests.—Ernst Gram.

5711. JØRSTAD, I. Norske forsøgssprøjtninger mot sopsykdommer på frukttrær i 1921 og 1922. [Norwegian spraying experiments against orchard diseases, 1921 and 1922]. Nordisk Jordbrugsforskning 1923: 460-466. 1923.—Delayed dormant spray with lime-sulphur, 1:10, may be of influence on *Psylla mali* but has only slight importance for the control of scab. Of the summer sprays against scab, the pink spray is important in the West where rain is abundant, but less important in the dryer East. Spraying directly after the petals fall is necessary everywhere. A 3rd application is useful, but general rules for the time cannot be given. Shedding of immature fruit is common in certain years but is at least no more on sprayed than on unsprayed trees. The less scabby the fruit, the better the size it attains. In western Norway, where spring rain is abundant, the blossoms may be attacked early by the scab, while in the eastern localities with a dry spring, scab usually is not discovered before August. Lime-sulphur spray and sulphur dust have been equally effective against scab. Two per cent NaCl, applied against apple mildew, caused burning; 1% formalin, nicotine + soap, and lime-sulphur were ineffective, while lime-sulphur + gelatin (75 gm. to 100 l. of spray) and sulphur dust were effective. Against *Monilia* brown-rot on cherries, a delayed dormant spray with 2% copper sulphate or lime-sulphur has shown some effect.—Ernst Gram.

5712. JØRSTAD, I. Om farlige plantesygdommer og hvad som gøres for å hindre deres udbredelse. [Dangerous plant diseases and the prevention of their dispersion.] Nordisk Jordbrugsforskning 1924: 333-354. 1924.—Important pandemics and the accompanying legislation and administrative work are reviewed historically and geographically. The U. S. A. Plant Quarantine Act of 1912 has caused the establishment in Europe of state inspection services and interstate quarantines, particularly directed against potato wart. The measures against this disease have been useful, delaying their dispersion until the immune varieties have made the disease less threatening. In Norway a general plant disease act was passed in 1916; in Denmark, in 1923. An interscandinavian conference of the state pathologists and entomologists, in 1922, recommended to the respective governments the acceptance of the Rome Convention of 1914, but with certain reservations.—*Ernst Gram*.

5713. KIRCHNER, OSKAR V., UND H. BOLTSCHAISSER. Die Krankheiten und Beschädigungen unserer landwirtschaftlichen Kulturpflanzen. [The diseases and injuries of crop plants.] 3rd ed. vii + 679 p. E. Ulmer: Stuttgart, 1923.—This treatise is intended to enable those interested in the diseases and insect injuries of crop plants to diagnose them readily and accurately. In addition to its being a practical handbook for use in identifying different troubles, it is useful to the student of fungi and insects in giving very accurate and detailed descriptions of the organisms. To facilitate work in identification, the various types of crops are treated, in turn, with the various parts of the plant as subheadings (leaves, roots, stems, blossoms and fruit). Under these headings various fungi and insects are described and physiological troubles discussed.—*Lillian C. Cash*.

5714. KLIMESCH, JOS. Eichensterben in Jugoslawien. [Death of oak in Jugoslavia.] Wiener Allg. Forst- u. Jagdzeitg. 42: 271-273. 1924.—Various factors causing unusual losses in oak stands in Jugoslavia are discussed with particular reference to Dalmatia and Slavonia. In both of these localities the oak mildew (*Microsphaera alni* var. *quercina*) has been prominent. In Dalmatia, grazing and caterpillar damage have made the sprout forest of oak and mixed hardwood species very bushy and dense from repeated heading back. This has given rise to conditions exceptionally favorable to the development of mildew. In Slavonia, caterpillars and mildew have killed strips of timber corresponding to the advancing columns of caterpillars. This was at first erroneously ascribed to flooding of the areas by the River Save.—*F. S. Baker*.

5715. KOCK, GUSTAV. Saatgutenerkennung und Pflanzenschutz. [Seed certification and plant protection.] Wiener Landw. Zeitg. 74: 413-414. 1924.—This is a statement of the requirements in respect to relative freedom from plant diseases, for official certification of cereal and clover seed. Instructions for the recognition of the principal diseases in the field, and also in commercial seed samples are given. Fields or samples showing 5% of disease of all kinds are rejected.—*F. Weiss*.

5716. KROUT, W. S. Combatting apple scab: Spraying and dusting experiments in 1922. Massachusetts Agric. Exp. Sta. Bull. 214. 29-41. 1923.—Excellent control was secured both by the sulphur dust and the lime sulphur spray on McIntosh apples, despite very unfavorable weather. Dry lime-sulphur was just as effective as liquid lime-sulphur. Copper-lime dust was found to be undesirable on account of russetting of the fruit. A pre-pink application is recommended in addition to the regular spray schedule. Condensed recommendations for both dusting and spraying are included.—*P. J. Anderson*.

5717. MELHUS, I. E., J. H. MUNCIE AND WM. T. H. HO. Measuring water flow interference in diseased stems. (Abstract.) Phytopathology 15: 44. 1925.

5718. MURRAY, J. C. Reports of field assistants. Australian Sugar Jour. 16: 607-609, 611. 1924.—In this section, Q.813 is resistant to mosaic disease and gumming disease and also to other infectious diseases of less importance; H.Q.285 is resistant to mosaic and minor diseases, but tolerant to gumming; Q.970 is fairly resistant to disease but N.G.64 Sport is susceptible; E.K.28 is fairly resistant to mosaic but probably susceptible to gumming; and D.1135 is tolerant to gumming, but fairly resistant to mosaic.—In Mount Bauple the best cane varieties appear to be M.1900, Q.813, and H.Q.285; canes making a good showing are Q.970, N.G.64 Sport, E.K.28, D.1135, H.Q.426, and M.189. In the Nambour and Coolumb districts a good showing is made by E.K.28, Q.813, H.Q.285, Gingila, N.G.15 and, on the higher lands, M.1900 Seedling.—*Nellie E. Fealy*.

5719. NAVARRO, L. *Las enfermedades del olivo*. [Diseases of the olive.] 176 p. 43 fig. Calpe: Madrid, 1923.—This primer includes diseases produced by bacteria, fungi, parasitic phanerogams and insects, the last occupying by far the largest part of the book. In each case, a description of the pest is followed by its effect on the host and measures for control, if known.—*Lillian C. Cash*.

5720. NEILL, J. C. Loose smut of wheat. *New Zealand Jour. Agric.* 29: 177-187. 2 fig. 1924.—Experiments on the wheat variety, Major, indicate that a presoak temperature of 84°C. gives slightly better germination than 63°, when the seed is used at once. Drying quickly in an air current at 95-100° did not injure germination.—*N. J. Giddings*.

5721. NOBLE, R. J. Plant quarantine measures. Some observations on their establishment in Australia. *Agric. Gaz. New South Wales* 35: 883-888. 1924.—Geographical isolation has been an important factor in the present freedom of Australia from foreign diseases and insect pests. Maintenance of future freedom from these troubles will be facilitated by the production of the needed plants and plant products within the borders of the Commonwealth. Necessary importations should be attended with every safeguard.—*L. R. Waldron*.

5722. RIVERA, V. Cryptogamic epidemics and the environmental factors that determine them. *Internat. Rev. Sci. and Pract. Agric. N.S.* 2: 604-610. 1924.—From his observations and experiments on the oidium of wheat, oak, spindle-tree and rose, extending over a period of years, the author draws his conclusions regarding the influence of environmental factors upon cryptogamic epidemics. In his opinion, a study of the environmental factors favorable to the outbreak of epidemics should be made to include both the factors inducing the fungous attack and the causes determining the susceptibility of the organ of the host plant. Greenhouse studies have shown that the "moment of least resistance" occurs during partial wilting of the host tissues, and that maximum turgidity brings about resistance. This method of attack is assumed *a priori* for plants in the open. The striking susceptibility produced by fertilizers, especially nitrogen fertilizers, is explained by the more frequent periods of decreased turgidity of the plants. The same environmental condition that is favorable to the fungus determines the resistance of the host plant, while the factors that cause susceptibility of the host also hinder the development of the spores by which the fungus is spread. Two opposite factors, namely susceptibility—absence of fungus, and resistance—presence of fungus are commonly present under normal conditions and explain why the fungus does not succeed in destroying its host every day even though it continually produces spores.—*Wanda Weniger*.

5723. SIEGLER, E. H. Some insecticidal properties of the fatty acid series. *Jour. Agric. Res.* 29: 259-261. 1924.—An investigation of the aliphatic fatty acids has shown that certain members of the saturated series possess promising insecticidal properties as contact sprays. The studies have indicated that the toxicity of soaps, when used as contact sprays, is due to the release of the acid components through hydrolytic dissociation.—*Author*.

5724. SPENCER, HERBERT H., H. ZIMMERLY, AND RAY J. DAVIS. Dusting and spraying eggplants. *Virginia Truck Exp. Sta. Bull.* 47. 331-347. 1 fig. 1924.—Experiments begun in 1918 were continued for 4 years, to test the relative efficiency of spraying and dusting for the control of eggplant insects and diseases, especially flea-beetles, aphids, and the fruit-rot fungus. Excellent results in increased yields of fruit were secured from plots sprayed with 4-8-50 Bordeaux mixture to which 2 pounds of calcium arsenate, lead arsenate, or zinc arsenite were added. Bordeaux alone, and Bordeaux soap, were ineffective, but the arsenicals alone produced large increases in yield over controls. Monohydrated copper sulphate 16% dust, plus calcium arsenate, gave somewhat better control of insects and fruit-rot than did the liquid sprays, when applied on the same date. It is recommended that dusting and spraying of eggplants should start in the seedbed, followed by weekly applications while the plants are growing rapidly.—*J. T. Rosa*.

5725. STRONG, RICHARD P. The relationship of certain "free-living" and saprophytic microorganisms to disease. *Science* 61: 97-107. 1925.—Several bacteria and species of *Spirochaeta* are discussed as to their power of changing over from internal saprophytes to disease-producers, particularly *S. eurgyrata*, *S. stenogyrata*, *S. bronchialis* and *S. schaudinni*. A flagellate from Euphorbiae (not specified) may become pathogenic to animals after passage through the insect hosts. An amoeba from *Euphorbia* was pathogenic to animals after intraperitoneal inoculation.—*C. J. Lyon*.

5726. TAYLOR, W. H. **Tomato culture.** New Zealand Jour. Agric. 29: 40-43. 1924.—Notes are given on the occurrence, destructiveness and control of black stripe, sleeping disease, tomato mildew (*Cladosporium fulvum*), blossom-end rot, and damping-off or foot-rot, of tomatoes.—N. J. Giddings.

5727. TEHON, L. R. A preliminary report on the occurrence and distribution of common bacterial and fungous diseases of crop plants in Illinois. Bull. Illinois Nat. Hist. Survey 15: 173-235. 1924.—The results of 3 seasons' survey work and the early history of disease survey work in Illinois are presented. Methods used in estimating damages are discussed and an account is given of 165 diseases on 44 crops in the order of the importance of the crops and the diseases. Under each disease is presented a brief description of the symptoms, a short summary of its history in Illinois, distribution, losses caused and methods of control.—The crops discussed are cereals, forage crops, fruits, vegetables, field crops and a few ornamentals. Accompanying each disease discussion is a map showing its known distribution according to counties.—Forty-two tables are given in the text, including a number of field observations and records of counts giving actual loss figures. Many other points are covered in the tables.—H. W. Anderson.

5728. TEHON, L. R. Some outstanding features of the plant disease situation in Illinois during 1923. Trans. Illinois State Acad. Sci. 17: 88-93. 1924 [1925].—A weather summary shows that the unusual wet conditions during the growing season favored disease development. Bitter rot of apple was recorded as unusually severe, black rot of apple less prevalent than usual and blotch about normal but extending northward of its usual range. Fire blight was unusually severe. Peach diseases were more severe than usual, especially bacterial shot-hole. Leaf curl was also serious in central Illinois. A leaf curl of red plums caused by *Ectoas-cus mirabilis* was unusually abundant. Diseases of small fruits are recorded. Leaf rust of wheat was held in check by low spring temperatures; stem rust was severe; loose and stinking smut caused considerable loss. The range of flag smut was increased. Other cereal diseases are mentioned.—Diseases of vegetable crops included angular leaf spot and anthracnose of cucumber, wilt and anthracnose of watermelons, yellows, black rot and club root of cabbage, early blight, blossom-end rot and leaf spot of tomatoes, black leg, curly dwarf and early blight of potatoes. A table of disease losses is given showing a grand total for the state of \$75,259,000.—H. W. Anderson.

5729. TEMPLETON, J. The effects of heat treatment of cotton seed on its germination and on the subsequent growth and development of the plants. Ministry Agric. Egypt. Tech. and Sci. Serv. Bull. 48. 1-9. Pl. 1-3. 1924.—Germination tests carried out in the laboratory by the Entomological Section and by the present writer fail to show that the germination of cotton seed subjected to heat treatment at the ginneries is adversely affected. When the seed are sown singly in pots sunk in the soil in the open, differences are apparent in favor of plants from unheated seed, with regard to rate and quantity of the so-called "field germination," and also in the average heights and the dry weights of the plants, after a period of 63 days. Under normal field conditions, where the seed is shown by handfuls in "holes," and the resulting plants thinned out to 2 per "hole," the above noted differences with regard to "field germination," appear to be entirely negligible. Heat treatment of the seed has no apparent effect on the flowering or the yield of the resulting plants.—*Author's summary.*

5730. THAYER, PAUL W. **Tree surgery for the fruit grower.** Amer. Fruit Grower 44¹¹: 7, 16, 28. 4 fig. 1924.—This is a discussion of preventive and remedial operations which can and should be performed in our orchards. Correct pruning and shaping of the tree are discussed, together with dressings for wounds, and the bracing of trees.—Arthur S. Rhoads.

5731. WEBER, A. **Plantesygdomme i England.** [Plant diseases in England.] Gart.-Tidende 40: 481-485. 1924.—The nurseries around London are remarkably free from diseases, mostly because the preventive work is well cared for. In the elaboration of control measures the Exp. Sta. at Turners Hill, erected by an association of nurserymen and now subsidized by the State, plays an important role.—Ernst Gram.

5732. WEBER, A. **Tomat- og Agurksygdomme.** [Tomato and cucumber diseases.] Gart.-Tidende 40: 265-267, 277-280, 289-293, 302-304, 313-317. 8 fig. 1924.—An account is given of the important diseases, with special and general directions for their diagnosis and control.—Ernst Gram.

5733. WEISS, FREEMAN, AND PHILIP BRIERLEY. **The present status of investigation of varietal resistance to disease in the potato.** *Potato News Bull.* 1: 112-116, 132-140. 1924.—This is a review of progress in securing disease resistance in the potato since 1905, when active efforts along this line were first begun in America. The available data are presented under the heads of the important potato diseases. A selected bibliography of 34 titles is given.—*F. Weiss.*

5734. WHETZEL, H. H. **The future of dusting.** *Trans. Peninsula Hort. Soc.* 1924: 26-33. Dover, Delaware, 1925.—In this address the author briefly reviews the past history and present status of dusting, and then discusses its future.—“One of the greatest fields for new discoveries in dusting lies in the direction of new fundamental types of fungicides and insecticides. . . . Another direction in which development . . . is to be expected is in its wider applications. . . . And finally, in the matter of dusting machinery decided developments are to be anticipated. . . .”—*Frederick V. Rand.*

5735. WINBERG, O. F. E. **Rebuilding the Gulf Coast citrus industry.** *Amer. Fruit Grower* 44¹¹: 8, 24. 3 fig. 1924.—This is an account of the investigations made in connection with the upbuilding of the Gulf Coast citrus industry begun in 1915, under the auspices of the Gulf Coast Horticultural Society. Special stress is laid on the value of spraying to conserve the vitality of the trees in case of attack by fungous diseases and insects and on the importance of the vitality of the trees as a factor in resisting cold. Several outstanding requisites are given for the rebuilding of the Satsuma orange industry which suffered seriously in January, 1924, from a severe freeze, the 2nd of the kind since 1899.—*Arthur S. Rhoads.*

5736. WOGLUM, R. S. **Liquid gas, cyanofumer or pots—which shall it be?** *California Citrograph* 6: 350-351. 1921.—The unsatisfactory results in fumigation and demands for a return to former methods are confined to a rather limited area and are partially explained by the increased resistance of some of the scales to fumigation. Careful tests have shown that at warm temperatures, liquid gas is more efficient than other forms of cyanid and it is believed that improvements will be made in the application of the liquid gas so that its use in cooler weather will prove more satisfactory.—*C. S. Pomeroy.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 5007, 5041, 5075, 5077, 5080, 5081, 5095, 5184, 5387, 5423, 5798, 5799, 5800, 5815, 5826, 5840, 5842, 5847, 5876, 6027, 6029, 6032)

5737. ANONYMOUS. [Rev. of: LONG, HAROLD C. **Plants poisonous to live stock.** (Cambridge Agricultural Monographs) 2nd ed. viii + 120 p. Univ. Press: Cambridge, 1924.] *Nature* 114: 892. 1924.

5738. BEAL, GEORGE D. **Can the anthraquinone drugs be scientifically valued?** *Jour. Amer. Pharm. Assoc.* 13: 215-217. 1924.—Mention is made of the various methods proposed for the proper evaluation of the anthraquinone-bearing drugs. In relation to the constitution of this class of drugs, the author favors the hypothesis that they are glucosidal in character for the following reasons: (1) Glucoside-like derivatives have actually been isolated and on appropriate treatment have yielded a sugar and anthraquinone; (2) prolonged extraction in presence of water and of high temperatures yields an extract from which much larger amounts of free anthraquinone can be separated than when extraction takes place under non-hydrolyzing conditions; (3) the action of hydrolyzing agents on the drug or its extract produces a greatly increased yield of free anthraquinone derivatives.—With bibliography.—*Anton Hogstad, Jr.*

5739. BERRY, P. A. **An investigation of the essential oil from *Eucalyptus cneorifolia* D. C. (The “Narrow Leaf Malee” of Kangaroo Island.)** *Trans. and Proc. Roy. Soc. South Australia* 46: 207-221. 1922.—The principal constituent of this oil is cineol (67%); and in addition, cymene (15%), limonene (5%), pinene (3%), aldehydes (7.5%), sesquiterpene (1%), phenols,

esters and acids (0.5%) are present. Changes in physical properties, on keeping, include increases in specific gravity, in refractive index and in dispersion and a decrease in rotation. These changes are accelerated by exposure to light.—*Wm. Randolph Taylor.*

5740. BEYTHIEN, A., UND P. PANNWITZ. *Beiträge zur Untersuchung von Kakao und Schokolade.* [Investigation of cocoa and chocolate.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 46: 223-235. 1923.—Reports are given of investigations of cocoa-shells, germ of the seed, and of milk-chocolate, chiefly by chemical and physical methods.—*E. Stanford.*

5741. BLISS, A. R., JR. A pharmacodynamic study of the anthelmintic properties of two oils of *Chenopodium*. *Jour. Amer. Pharm. Assoc.* 14: 93-98. 1925.—The author's investigations were conducted upon 3 samples of oil: (1) That distilled from plants which had been shipped from Carroll County, Maryland, S.G.O. 966; (2) that distilled from plants cultivated in Adams County, Illinois, S.G.O. 0.970; and (3) that distilled from cultivated, wild wormseed plants found in Adams County, Illinois, S.G.O. 964. Sample No. 1 was found to be 97.91% effective as an anthelmintic; sample No. 2 was found to be 98.50% effective; sample No. 3, 96.27% effective.—Dogs were used as test animals, the standard dose of oil being 0.1 mil per kilo weight. The oils were administered in soft elastic capsules which were followed immediately by the administration of 1 fluidounce of castor oil. The dogs were given no solid food for 24 hours. Early the following morning Oil of *Chenopodium* and Castor oil were administered. No food was given for at least 3 hours after the drugs. All feces passed during the following 5 days were carefully examined for ascarids. At the end of the 5th day the animal was killed (shot), and the alimentary tract from oesophagus to anus was slit and examined for ascarids and lesions.—On the basis of these findings, the author states that Oil of *Chenopodium* properly distilled from plants cultivated in the Middle Western States is as efficacious in dogs against ascarids as that of the Maryland oil, and also ventures to state that these findings apply to man also.—*Anton Hogstad, Jr.*

5742. CLARK, R. H., AND K. B. GILLIE. The cascara content of the wood and bark of *Rhamnus Purshiana*. *Amer. Jour. Pharm.* 96: 400-412. 1924.—The authors present data of a comprehensive investigation of the constituents of the fresh bark and wood of *Rhamnus purshiana*, with the following conclusions: (1) The wood contains sufficient of the active constituents to make it a source of commercial extracts; (2) the griping effect was far from common in extracts made from fresh materials; (3) habitat and climatological conditions exert considerable influence on activity of the drug; (4) the age of the tree from which bark extracts were made, appears to have little influence on the activity but in the case of the wood, the activity shows a decrease with age; (5) the activity of the extracts is but little affected when hydrolysis is retarded during the course of preparation; (6) complete hydrolysis does not destroy the activity of the extracts and consequently the active principle would not appear to be a glucoside, although it might be the hydrolytic product of one; (7) none of the physical or chemical properties determined can be said to show any close relationship to the activity of the extracts.—*Anton Hogstad, Jr.*

5743. CLUTE, WILLARD N. The white snakeroot. *Amer. Bot. [Joliet, Illinois]* 31: 1-3. 1925.

5744. COOK, E. FULLERTON. Chocolate. *Amer. Jour. Pharm.* 96: 549-556. *Pl. 1-5.* 1924.—This is a popular lecture dealing with methods of production, and commercial products derived from the cacao bean together with a few historical notes.—*Anton Hogstad, Jr.*

5745. DAUPHINEE, JAMES ARNOLD. The physiological value of British Columbian foxgloves. *Amer. Jour. Pharm.* 96: 796-804. 1924.—Examination of 5 different samples of British Columbian foxglove leaves by the cat method of Hatcher and Brody as well as by the guinea pig method of Reed and Vanderkleed, showed that they were slightly higher in strength as grown elsewhere. Experimentation with various fertilizers showed that cow manure is the best to use, in order to obtain both quantity and quality of *Digitalis* leaves. With bibliography.—*Anton Hogstad, Jr.*

5746. FARWELL, OLIVER ATKINS. An adulterant of Queen-of-the-Meadow. *Jour. Amer. Pharm. Assoc.* 13: 121. 1924.—This brief note calls attention to the fact that some recent lots of what is known in pharmaceutical literature as *Eupatorium purpureum* Linn., were

found to contain as high as 20% of ironweed, *Vernonia noveboracensis* Willd. The author states that *Eupatorium purpureum* Linn. should be correctly designated as *Eupatorium maculatum* Linn. The ironweed, when mixed with the genuine drug in a thorough manner, might go undetected except through closest scrutiny.—*Anton Hogstad, Jr.*

5747. FARWELL, OLIVER ATKINS. **Mexican cactus a substitute for Cactus grandiflorus.** Jour. Amer. Pharm. Assoc. 13: 211. 1924.—The author has shown that what has been imported from Mexico for a great number of years as the official *Cactus grandiflorus*, is a spurious article, which is perhaps best known to the botanical world as *Cereus nycitellus* Link and also as *Cereus pteranthus* Link & Otto. According to the work of Britton and Rose, this spurious form will be known as *Selenicereus pteranthus* (Link & Ott.) Britton & Rose, while the genuine *Cactus grandiflorus* Linn. becomes *Selenicereus grandiflorus* (Linn.) Britton & Rose.—He also states that E. M. Holmes of London, England, most emphatically denies the existence of *Cactus grandiflorus* Linn. in Mexico and that it was impossible to get the genuine article from that country. The author's investigations have supported the above mentioned statements by Holmes.—*Anton Hogstad, Jr.*

5748. FARWELL, OLIVER ATKINS. **Substitute for nut gall.** Amer. Jour. Pharm. 96: 435. 1924.—As expressed by the author "Wonders never cease," for here is recorded an attempt to substitute acorns for nutgalls. The author includes description of acorns thus found.—*Anton Hogstad, Jr.*

5749. GATHERCOAL, E. N. **Kino, gambir and catechu.** Jour. Amer. Pharm. Assoc. 13: 103-112. 1924.—A commentary upon this group of 3 astringent drugs is given with proposed changes for the various standards. The investigation was developed along the lines indicated in the following: (1) Do these astringent drugs deteriorate upon aging? (2) Is the solubility in water, alcohol and hydro-alcohol a suitable test for the determination of the quality of these drugs? (3) Are there any tests of identity for these drugs? (4) Why is gambir preferable to black catechu as an astringent drug?—The author finds that if the percentage of the hydro-alcohol soluble astringent constituents is a criterion of therapeutic value then kino markedly deteriorates with age, catechu does so to some extent, but gambir shows but slight change in this respect. The anhydrous insoluble residue was found to have the following advantages as a criterion of quality over either the solubility or the anhydrous extract: (1) It is most easily and accurately obtained; (2) is not affected by the percentage of moisture in the drug; and (3) is most critical. Suitable standards would be as follows: From boiling water, kino 10%, gambir 15%, catechu 10%; from cold water, kino 30%, gambir 30%, catechu 30%; from alcohol, kino 35%, gambir 35%; catechu 35%; from diluted alcohol, kino 20%, gambir 20%, catechu 20%.—This paper contains in addition many other facts for consideration in the revision of standards for these drugs.—*Anton Hogstad, Jr.*

5750. GITHENS, THOMAS S. **Preliminary report on studies of Miré.** Jour. Amer. Pharm. Assoc. 13: 102. 1924.—It appears as though the active principles of this drug are as completely removed by extraction with hot water, as by employing various strengths of alcohol 10 to 95%. The active principles were not injured by boiling and were not volatile with steam.—Physiological tests, in which frogs, mice and rabbits were employed, indicate the following: (1) Paralysis of voluntary motion by action on spinal cord; (2) stimulation of the peripheral motor-apparatus, resulting in twitching of muscles; (3) stimulation of the salivary and of the sweat mechanism; (4) slowing of the heart, probably from vagus stimulation; (5) stimulation of peristaltic movements may occur.—The materials used in these investigations were supplied by H. H. Rusby and were collected in central Bolivia.—*Anton Hogstad, Jr.*

5751. GRIEBEL, C. **Ergebnisse der Untersuchung von Heilmitteln, Geheimmitteln, kosmetischen und ähnlichen Mitteln.** (11 Fortsetzung.) [Results of investigations of medicines, patent medicines, cosmetics, etc. (11th report.)] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 442-446. 1924.—Brief reports are given as to the composition of 35 German proprietaries, emmenagogues, asthmatic preparations, etc.—*E. E. Stanford.*

5752. GRIFFITH, IVOR. **Idiosyncrasies, or the story of a sneeze.** Amer. Jour. Pharm. 96: 170-193. Pl. 1-6. 1924.—This popular lecture deals with the study of pollen in relation to hay fever. A classification of hay fever producing plants by states is embodied in the paper.—*Anton Hogstad, Jr.*

5753. HEPBURN, JOSEPH S., AND ROBERT H. STROH. A contribution to the chemistry of Alkatan. Amer. Jour. Pharm. 96: 804-809. 1924.—As stated by the authors, according to Pittier, 3 species of plants are known as alkatan in Costa Rica: *Piper acuminatissimum*, *P. medium* and *Baccharis trinervis*. The latter 2 species occur in the Pacific littoral. *P. acuminatissimum* is widely distributed in the great valley of the Rio San Juan. In English, *P. acuminatissimum* is known as Alkatan.—Chemical examination failed to reveal the presence of alkaloids. An oleoresin and a saponin were noted. Pharmacological tests employing albino rats, yielded no definite conclusions as to the presence or absence of growth-promoting vitamins. A percentage composition table of the leaves of the more commonly sought for constituents is included in the report.—*Anton Hogstad, Jr.*

5754. HOGSTAD, ANTON, JR. Aims and development of the Pharmacognosy Laboratory, South Dakota State College Division of Pharmacy. Amer. Jour. Pharm. 96: 675-688. Pl. 1-2. 1924.—A description is given of the newly-installed pharmacognosy laboratory, equipped for all phases of pharmacognostical studies. The special-type pharmacognosy desk, as designed by the author is described in detail. The greater need of phyto-chemical studies in relation to the subject of Pharmacognosy is emphasized. The general outline of the work in Pharmacognosy as offered at the South Dakota State College, Division of Pharmacy, is also discussed.—*Author.*

5755. HOGSTAD, ANTON, JR. Some studies on the so-called "Western" (South Dakota) oil of American wormseed. I. A preliminary note as suggested by the results of the 1923 investigations. Amer. Jour. Pharm. 96: 809-816. Pl. 1-3. 1924.—Distillations conducted at various periods over 1 season, show that the oils obtained from plants in blossom contain about 6% of ascaridol; those from the partially mature plants some 20% and those from the fully matured herb 50-56% of ascaridol. The oils as obtained from the mature herb complied with the requirements of the U. S. P. IX, while those from the flowering and partially mature herb lots did not comply with these requirements. The author also points out, that the ascaridol is possibly formed from p-cymene, and that ascaridol is not a decomposition product of p-cymene as heretofore suggested. Tables of physical constants are included in the report.—*Author.*

5756. HOWELL, E. V. Cinara, Carduus and Scolymus of the ancients. Jour. Amer. Pharm. Assoc. 13: 1120-1124. 1924.—A historical review is presented of the artichoke, to which the names Cinara, Carduus and Scolymus and even Cactus have been given by ancient writers.—*Anton Hogstad, Jr.*

5757. JORDAN, C. B., JULIA P. WHELAN, AND W. F. GIDLEY. A study of the cause of trembles (in domesticated animals) and milksickness (in man). Jour. Amer. Pharm. Assoc. 13: 206-210. 1924.—It has been fairly well established that the so-called milksickness (in man) and trembles (in domesticated animals) is due to white snakeroot, *Eupatorium urticaefolium* (= *E. ageratoides*). The material examined by the authors was collected about 2 miles northwest of Purdue University. A chemical examination of this plant demonstrated the following facts: (1) The toxic principle of the plant is destroyed at the temperature of the water bath; (2) an aqueous menstruum containing 0.1% HCl extracts the toxic principle; (3) no alkaloids or glucosides are present; (4) the fluidextract with the 0.1% HCl menstruum readily ferments and this fermented fluidextract is non-toxic; (5) by steam distillation a volatile oil is obtained having the odor of pinene; (6) the addition of strong HCl to the fluidextract produces a constituent with a pronounced apple-like odor; (7) a great deal of resin is present, but the resin is not the toxic principle; (8) the drug contains considerable aluminum salts, but its toxicity is not due to inorganic aluminum salts.—*Anton Hogstad, Jr.*

5758. KILMER, F. B. Drug clerks and belladonna. Jour. Amer. Pharm. Assoc. 13: 1131-1138. Pl. 1. 1924.—This is a miscellany of notes, concerning discoveries by various drug clerks, as to the action of belladonna in days gone by. Many interesting historical notes are included. The author emphasizes the fact, that there are "Many worlds to conquer, even in belladonna," referring to our knowledge of drug constituents, properties and their uses.—*Anton Hogstad, Jr.*

5759. KILMER, F. B. Rambling among the nightshades. Amer. Jour. Pharm. 97: 4-38. Pl. 1-18. 1925.—A historical review of the nightshades is given down to the present time,

where one finds the narcotic solanums entrenched on a rational basis. As stated by the author, "much has been written, much forgotten, and but little is really known."—He believes that man inherited his knowledge of the narcotic Solanums from *Pithecanthropus erectus*, and that man's first cognizance of this group was not a discovery but an inheritance. One of the illustrations as contained in the paper depicts the belladonna on the edge of the Hercynian forest, which in the author's belief represents the original type. Many interesting and valuable facts are brought to light in regard to the history of the Solanums.—*Anton Hogstad, Jr.*

5760. KONANTZ, W. A. **The production of oil of American wormseed, U. S. P., in Illinois.** Jour. Amer. Pharm. Assoc. 13: 201-205. Pl. 1-3. 1924.—Contrary to the generally accepted opinion that a standard oil of American wormseed can only be best produced in Maryland, the author has shown that a standard quality of oil can be produced in Adams County, Illinois. The type of still employed by the author was capable of receiving a charge ranging from 35 to 50 pounds of herb. Best results were obtained with a $\frac{1}{8}$ inch steam inlet.—Experiments were conducted on variation of steam pressures; variation of distillation temperature; and distillation of different parts of the plant. In general, the ascaridol contents ranged from 71.5 to 85.5% and the S. G. constants from 0.960 to 0.975.—*Anton Hogstad, Jr.*

5761. KREMERS, ROLAND E. **The volatile oil of *Mentha Canadensis*.** Jour. Amer. Pharm. Assoc. 14: 32-35. 1925.—The material for this investigation, 1000 pounds of original herb which yielded 144.5 pounds of air-dried herb, was collected chiefly during the flowering period at Plumbago Canyon, Albany County, Wyoming, at an altitude of 7000 feet.—Upon distillation and subsequent cohobation, a total of 2.16% of an oil was obtained (based on dry herb). Examination of the oil revealed the presence of d-pulegone as the chief constituent. It is accompanied by another ketone, as yet not positively identified, which yields a semicarbazone, melting at 138-140°C. The lower fractions contain chiefly l-limonene. Evidence was obtained of the presence of an alcohol, but it is not l-menthol.—Physical and chemical constants of the oil as well as fractionating notes are included in the report.—*Anton Hogstad, Jr.*

5762. LAWALL, C. H. **The romance of drugs.** Amer. Jour. Pharm. 96: 246-277. Pl. 1-8. 1924.—This popular lecture presents in an interesting manner the history of the use of drugs from the very earliest times. A number of the more important drugs including opium, aloes, camphor, sarsaparilla, castor oil, senna, rhubarb, cinchona, coca, ipecac, guaiac and mandrake are specifically considered.—*Anton Hogstad, Jr.*

5763. LEWINSKY, ERICH. **Vergleichende Anatomie der Wurzeln und Rhizome einiger pharmakognostisch wichtiger Solanaceen. Lokalisation und Bestimmung der Alkaloide.** [Comparative anatomy of the roots and rhizome of Solanaceae of importance in pharmacognosy. Localization and determination of the alkaloids.] Bot. Archiv. 6: 312-333. Fig. 1-6. 1924.—The chief places of storage of the alkaloids in the roots of Solanaceae are the epidermal and subepidermal layers. Because of its alkaloidal contents, the rhizome of *Scopolia* species can be used for the same purposes as *Radix Belladonnæ*. The alkaloidal content surpasses that of belladonna roots. The content of alkaloids in the roots of *Mandragora vernalis* is less than that in *Scopolia* species but above that of belladonna. The rhizome and roots of *Physalis alkekengi* contain no alkaloids. The solanin content of the roots of *Solanum dulcamara* agrees with that in the roots of this plant.—*William Seifriz.*

5764. LONG, H. C. **Plants poisonous to livestock.** (Cambridge Agricultural Monographs.) 2nd ed. viii + 120 p. Univ. Press: Cambridge, 1924.

5765. MACHT, DAVID I., AND JOHN C. KRANTZ, JR. **A phytopharmacological method for assaying Digitalis.** Jour. Amer. Pharm. Assoc. 13: 1115-1117. 1924.—The authors have employed the seedlings of *Lupinus albus* as a means of determining the toxicity of Digitalis preparations, which, if properly developed, may establish a method without recourse to animal experimentation. They find that the toxicity of various solutions of tincture of Digitalis (the alcoholic content remaining constant) varied directly with the concentration of the drug solutions, as exemplified by the fact that, growth of the plants in the Shive control being represented as 100%, their relative growth in different percentages of tincture of Digitalis varied from 96% to 0.1% concentration to 70% and 1.0% strength.—It was found

that the relative toxicity of 2 different samples of tincture of Digitalis on the Lupinus seedlings was in the ratio of 107.6% to 100%. The relative toxicity upon the mammalian heart, as determined by the cat method was 11.28 cc. in one case and 10.48 cc. in the other, a ratio closely corresponding to that obtained by the phyto-pharmacological method.—*Anton Hogstad, Jr.*

5766. MAIER, A. A., AND C. W. BALLARD. **Anthraquinone content of wormy rhubarb.** Jour. Amer. Pharm. Assoc. 13: 810-812. 1924.—It has been found that partially or wholly wormy rhubarb possesses a greater laxative effect than that of the sound root. It is to be borne in mind that in work of this kind, comparisons should be restricted to the same variety, because of the great variation in oxymethylantraquinone content in different commercial grades. The results, however, again open up the interesting question as to what really constitutes the active principle of rhubarb. Tschirch and Heuberger claimed that it contains no resin, the purgative action being due to anthraglucosides and derivatives (meaning that the constituents are emodin, rhein and chrysophanic acid). This the writer believes to be correct. The paper is supplemented with brief notes on the microscopical examination of the various samples which were tested chemically.—*Anton Hogstad, Jr.*

5767. MARKWOOD, L. N. **The isolation and properties of the alkaloids and oil of larkspur seed (*Delphinium Consolida*).** Jour. Amer. Pharm. Assoc. 13: 696-702. 1924.—The author has obtained a greenish yellow oil which has a slight characteristic odor resembling that of castor oil. The yield was 25% of the weight of seed. The physical properties of the oil are as follows: S. G. at 20°C., 0.889; refractive index at 20°C., 1.4581; saponification value, 181.2; acid value, 189.5; iodine value, 87.8; acetyl value, 34.9; unsaponifiable residue, 1.28%; elaidin test, negative. In addition, 2 crystalline alkaloids were isolated whose compositions have not been definitely established and a 3rd crystalline alkaloid which has yet not been obtained in a pure state. Of the first 2, delcosine ($C_{21}H_{33}NO_6$, with M. P. 198-199°C.) is identical with a product previously obtained, while delsoline ($C_{25}H_{41}NO_8$, with M. P. 207-209°C.) is an addition to the list of larkspur constituents. With bibliography.—*Anton Hogstad, Jr.*

5768. NESTLER, A. **Abnorme Zellen in Kakaopulver.** [Abnormal cells in powdered cacao.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 86-91. Fig. 1-10. 1923.—Certain abnormal cell-forms in powdered cacao (*Theobroma cacao*) are derived from seed grown together in twos and threes. Among such cell-forms are thick-walled sclerenchyma, colorless or with red-brown content; groups of more or less elongated, thick-walled porous cells with or without red-brown content; very large lignified cells and colorless fragments of large sclereids. These cells and the abnormal seed producing them are figured. Such seed are found in quantity only in low-grade cacao, and the presence of these cell-forms may be accordingly taken as an index of low quality. Samples of such cacao also contained numerous pollen-grains, apparently not from cacao-blossoms, and numerous spores. These samples were characterized by an odor resembling star-anise; the cause of this odor is unknown.—*E. E. Stanford.*

5769. NEWCOMB, E. L. **Plant science laboratory seminar (Botany-pharmacognosy-plant chemistry-pharmacology).** Amer. Jour. Pharm. 96: 80-114; 194-225. Pl. 1. 1924.—The work accomplished at the 1st annual plant science laboratory seminar, held at the University of Minnesota, during the week of August 20th, 1923 is reviewed. Laboratory demonstrations dealt with food and drug drying, cleaning and milling; drug sampling, grinding and sifting; handling of drugs and spices; herbarium materials; micro-analytical methods; optical identification of calcium oxalate; qualitative and quantitative microscopic analysis; and brief review of the work of the National Research Council (U. S. A.).—The topics discussed were as follows: Future of pharmacognosy; methods of instruction in the laboratory of Professor Tschirch; cyanogenesis; edibility of plants used as "greens"; vitamins; plant colloids; Digitalis standardization; American ergot; plant dermatitis; pollen in relation to hay fever.—*Anton Hogstad, Jr.*

5770. NICOLOFF, M. **Massenvergiftungen durch bleihaltigen roten Paprika.** [Epidemic poisoning from red paprika containing lead.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 269-270. 1924.—Owing to restricted import and other war conditions the Bulgarian

market was flooded during the late war with paprika containing red lead and other adulterants. Numerous cases of poisoning are attributed to the use of lead as an adulterant. Some samples contained 20% Pb_3O_4 .—*E. E. Stanford*.

5771. PALKIN, S., AND H. R. WATKINS. **Studies in the analytical chemistry of drugs. The determination of total alkaloids in nux vomica.** Jour. Amer. Pharm. Assoc. 13: 691-696. *Fig. 1.* 1924.—A shorter method is given for the assay of nux vomica preparations, along with comparative results in relation to the U.S.P. method. The authors conclude that the extreme slowness with which the last portions of alkaloid are extracted by the solvent is probably due to the presence of some other alkaloid, not strychnine or brucine. The process of extraction can be facilitated by careful control of the ammonia used. It is also essential that a preliminary precipitation be introduced into the assay.—*Anton Hogstad, Jr.*

5772. PEACOCK, JOSIAH C., AND BERTHA L. DE G. PEACOCK. **Notes on the iron-greening factor of Digitalis.** Amer. Jour. Pharm. 96: 875-885. 1924.—In relation to the so-called "tannin" constituent of Digitalis, the authors find that this drug does not contain gallic acid, gallotannic acid or tannins like those found in the pecan nut, red rose, mate, oak bark or wild cherry. They suggest that until more is known concerning this anomalous constituent of Digitalis, it may be referred to as the "iron-greening factor."—It was found that this iron-greening factor is soluble in 95% alcohol, and is completely absorbed by hide powder. Estimations of the "tanning value" by use of the hide powder method in hot water infusion showed 23.33% in one lot of drug and 26.66 in another. A cold water infusion of the latter gave figures to indicate 30%.—*Anton Hogstad, Jr.*

5773. PEACOCK, JOSIAH C., AND BERTHA L. DE G. PEACOCK. **Notes on the iron-greening factor of Digitalis.** Jour. Amer. Pharm. Assoc. 13: 629-636. 1924.

5774. RAMSAY, A. A. **Prussic acid in Indigofera australis.** Agric. Gaz. New South Wales 35: 844. 1924.—Recent as opposed to older investigations indicate that this plant contains up to 0.102% hydrocyanic acid. This is as much as is found in native fuchsia (*Eremophila maculata*).—*L. R. Waldron*.

5775. RUSBY, H. H. **Miré (Meé-Ray).** Jour. Amer. Pharm. Assoc. 13: 101-102. 1924.—This brief note sets forth what little information we have relative to this interesting plant, as communicated by the Indians of central Bolivia. No clue as to family relationship has been found from specimens collected by the author, since they consist of roots and leafy stems only. The Indians extract this drug by boiling, which does not appear to injure the active constituent. This fact suggests that it may be of an alkaloidal character.—According to the Indians of Bolivia, full doses produce the following symptoms: (1) Paralysis of all voluntary muscles, precisely like that due to alcoholic intoxication and which may result fatally, if the dose is sufficiently large; (2) no disturbance of sensation or intellect; (3) after a time there is profuse perspiration of the cold type, suggesting sympathetic paralysis; (4) this perspiration is capable of destroying all cutaneous parasites, which suggests cutaneous excretion of the active constituent of the drug.—It would appear from all evidence at hand that Miré possesses physiological properties distinct from those of any other known drug.—*Anton Hogstad, Jr.*

5776. RUSBY, H. H. **The pharmacodynamics of Caapi.** Jour. Amer. Pharm. Assoc. 13: 98-99. 1924.—Here are presented the few facts known concerning Caapi which may be defined as the root and rhizome of *Banisteria Caapi*, a woody vine inhabiting the central portion of the basin of the Amazon. In Bolivia, Caapi is used chiefly as an exhilarating and stimulating beverage, somewhat like tea and coffee. The decoction is always made with the addition of a certain leaf, which to date has not been botanically identified.—A very short time after drinking the decoction there is a powerful effect on the nervous system and on the circulation. The subject is restless and keeps a standing position. There is an intense anxious or fixed expression to the countenance and there are convulsive tremors. In a few minutes fear and prudence are destroyed, the subject becomes extremely active and is ready to fight anybody or anything, and suffering is disregarded. This condition lasts for hours, and is then followed by more or less exhaustion and somnolence.—*Anton Hogstad, Jr.*

5777. SCHNEIDER, ALBERT. **The paramecial method for the biologic assay of the Digitalis series.** Jour. Amer. Pharm. Assoc. 14: 128-129. 1925.—Employing *Paramecium caudatum*

as a test organism in preliminary tests for the assay of pharmaceutical preparations of *Digitalis*, the author demonstrates the following: (1) *Paramecium caudatum* and other species of *Paramecium* appear to be quite resistant to the action of the *Digitalis* series, since a dilution of 1:10 of the fluid extract does not kill within 3 minutes; (2) the results obtained by the paramecial method with preparations of *Digitalis*, *strophanthus*, *apocynum* and *squill* do not correspond with the results obtained by the official 1-hour frog method. The comparative results are lower than those given in the U.S.P.; (3) the results thus far obtained are sufficiently promising, however, to make it worth-while to perfect the method and give it further trial. The method of the author is described in the report.—*Anton Hogstad, Jr.*

5778. SCHWARZ, A. JOHN. On the sampling of crude drugs. Jour. Amer. Pharm. Assoc. 13: 212-215. 1924.—Some of the many difficulties encountered in sampling of crude drug shipments are summarized. The author is of the opinion that every package, regardless of the number in the shipment, should be individually sampled. A discussion follows of the 2 classes of drugs (from the samplers' viewpoint) namely, those with component parts having a diameter greater than 1 cm. and those less than 1 cm. in diameter. Examples of each class are discussed in relation to proper methods of sampling.—*Anton Hogstad, Jr.*

5779. SEIL, HARVEY A., AND EARL B. PUTT. The chemical examination of *Caapi*. Jour. Amer. Pharm. Assoc. 13: 99-101. 1924.—The authors, working on material obtained from H. H. Rusby, present the following analyses, according to the methods of the A. O. A. C.: Moisture, 5.20%; ash, 5.02%; acid insoluble ash, 0.65%; chloroform extract, 1.59%; ether extract, 1.04%; petroleum ether extract, 0.72%; tannin, 0.86%; reducing sugar as invert, 0.23%; other sugars as sucrose, 1.07%; crude fiber, 47.25%; 95% alcohol extract, 8.60%; water extract, 10.06%; volatile oil, 0.0042%; non-phenolic alkaloids, 1.88%; phenolic alkaloids, 0.03%. In the separation of alkaloids on a larger scale, evidence points to the presence of at least 3 alkaloids in *caapi*, (1) a phenolic alkaloid; (2) a non-phenolic alkaloid forming a difficultly soluble hydrochloride; and (3) a non-phenolic alkaloid forming a more readily soluble hydrochloride.—*Anton Hogstad, Jr.*

5780. STONEBACK, W. J. A paradise found. Amer. Jour. Pharm. 96: 667-674. Pl. 1. 1924.—An account is given of a visit to a quaint herb garden conducted by Eugene Rau, a retired pharmacist at Bethlehem, Pennsylvania. Some 50 plants, arranged according to families, represent a partial list of Rau's plantings.—*Anton Hogstad, Jr.*

5781. SUNG, L. K. Native Chinese methods of drug administration. Amer. Jour. Pharm. 96: 287-294. Fig. 1-2. 1924.—The Chinese interpretation of "disease" and various superstitious methods employed in their treatment are discussed. One illustration is a native prescription comprising ginseng, cinnamon, and magnolia, used for its stimulating and restorative effect in general debility and cachexia; the other one is an anatomical chart of the human body, reproduced from an old medical text.—*Anton Hogstad, Jr.*

5782. WAKEMAN, NELLIE. A chemical examination of the root of *Leptotaenia dissecta*. Jour. Amer. Pharm. Assoc. 14: 29-32. 1925.—The author reports on the chemical examination of a 100-pound lot of roots of *Leptotaenia dissecta* collected in the high Sierras. A volatile oil to the extent of 0.6% was obtained with the following constants: Density of original oil, 0.936 (24°); of cohobated oil, 0.917 (20°); angle of rotation of original oil, -4.16 (25°); of cohobated oil, -1.90 (23°). The oil possessed a high boiling point and was devoid of aldehydes and phenols, but contained 20-30% of the valeric ester of an unidentified alcohol, and about as much free alcohol.—After the evaporation of the solvent, the alcoholic extract of the drug separated into an aqueous and an oily layer, both acid in reaction. The oily layer contains much acid and ester. In the aqueous distillate from this oily portion, valeric acid, methyl alcohol and methylamine have been identified. Work is still in progress and a later report will be made.—*Anton Hogstad, Jr.*

5783. WIRTH, ELMER H. The detection of rosin in official resins, gum-resins and balsams. Jour. Amer. Pharm. Assoc. 13: 520-531. 1924.—The author has investigated the reliability of the various tests for detection of rosin in resins, gum-resins, balsams, etc., as an aid to the revision of these various monographs for the U.S.P. X. He finds that the methods for detection of rosin as stated in their respective monographs in the U.S.P. IX, give satisfactory results with samples of the following, adulterated with 5% of rosin: *Asafoetida*, *Ben-*

zoin, Balsam of Peru, Oil of Cade and Oil of Cinnamon. Tests given for Guaiac, Balsam of Tolu, Resin of Jalap and Resin of Scammony, however, do not give satisfactory results with corresponding samples adulterated with 5% of rosin. The copper acetate test as revised by the author, and the Halphen test, both give satisfactory results with the above-mentioned samples (except Oil of Cade with the Halphen test). Both methods give satisfactory results in the detection of rosin in American Styrax, Levant Styrax, Dammar, Shellac, Myrrh, Mastic, Dragon's Blood and Jalapin. They do not, however, give satisfactory results with Balsam of Copaiba and Venice turpentine. For general pharmaceutical testing the author recommends the copper acetate method, owing to its simplicity.—*Anton Hogstad, Jr.*

5784. WIRTH, ELMER H., AND E. N. GATHERCOAL. **Report on the Scoville organoleptic method for the valuation of Capsicum.** Jour. Amer. Pharm. Assoc. 13: 217-219. 1924.—By applying the Scoville organoleptic test the authors have shown that the home grown Capsicums are not inferior to the imported article, and also that there is a variation in pungency between Chillies of different sizes and botanical sources. This organoleptic test, as proposed for the U.S.P., is carried out as follows: Mix well 1.0 gm. of the powdered capsicum in 50 cc. of alcohol in a stoppered flask and macerate for 24 hours. Dilute 0.1 cc. of the clear supernatant liquid with 140 cc. of a 10% solution of sugar in distilled water. Five cc. of this solution swallowed at once will produce a distinct sensation of pungency and a taste of Capsicum in the mouth and throat.—The suggestion is made that only the African Chillies should be included in the U.S.P., and that the Scoville test is fully worthy of a place in the Capsicum monograph for the U.S.P. X.—*Anton Hogstad, Jr.*

5785. YOUNGKEN, HEBER W. **A review of the literature in pharmaceutical botany and pharmacognosy for 1922-1923 (August 1, 1922-August 1, 1923).** Jour. Amer. Pharm. Assoc. 13: 536-546. 1924.—The titles of the numerous papers reviewed are conveniently grouped as follows: Morphology; drug cultivation; micro-analysis and microchemic methods; drug adulteration and substitution; plant chemistry; ash determinations; history and etymology; and miscellaneous. Two pages are devoted to comments on the various outstanding papers.—*Anton Hogstad, Jr.*

5786. YOUNGKEN, HEBER W. **The drugs of the North American Indian.** Amer. Jour. Pharm. 96: 485-502. 1924.—This popular lecture embraces an extensive review of the vegetable, animal and mineral drugs as used by the North American Indian. Some 75 vegetables, 8 animal and 4 mineral drugs are considered. Those drugs now official in the U.S.P. and N. F. which were used by the Indians are listed.—*Anton Hogstad, Jr.*

5787. ZUFALL, C. J. **The educational value of a medicinal plant garden.** Jour. Amer. Pharm. Assoc. 14: 26-28. 1925.—This paper, written from the viewpoint of a pharmacognocist, calls to mind through the agency of specific cases, the educational value of a medicinal plant garden in connection with the pharmaceutical curriculum, especially that of pharmacognosy.—*Anton Hogstad, Jr.*

PHYSIOLOGY

B. M. DUGGAR, *Editor*

W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 5011, 5012, 5013, 5014, 5041, 5065, 5068, 5065, 5083, 5087, 5121, 5123, 5125, 5126, 5129, 5130, 5135, 5143, 5163, 5164, 5233, 5235, 5242, 5247, 5377, 5380, 5382, 5421, 5427, 5439, 5452, 5532, 5538, 5539, 5541, 5543, 5574, 5607, 5684, 5689, 5725, 5763, 5907)

GENERAL

5788. BAYLISS, W. M. **Principles of general physiology.** 4th ed. (Rev. by "a Committee of Sir William Bayliss's friends, biologists, physiologists, and chemists . . ."). xxviii + 882 p. 216 fig. Longmans Green & Co.: London, 1924.—The revisions and changes made were approved by the author prior to his death on Aug. 27, 1924. The nature of the revision is such as to incorporate the recent contributions to progress in the field of physiology, on both the plant and animal sides, since the publication of the 3rd edition. The chapter divi-

sions (1-24) are not changed, the paging is the same as in the previous edition except that the recent work is incorporated in the present edition as page 69a, 260a, 260b, 729a, etc., thus indicating at a glance in what fields of physiological science progress has been made, chiefly in the following: Structure of protoplasm, molecular structure of surface interfaces, physical chemistry of protein solutions, permeability of membranes, vitamins and "deficiency" diseases, metabolism of fats and carbohydrates, digestion and secretion, excitation in muscle, action of light and electricity on the living organism, oxidation and reduction in life processes, hormones in plants, and the action of drugs and other chemicals on the living organism. An extensive bibliography of 105 pages, including references from all sources, is brought up to date.—*Emery R. Ranker.*

5789. LOTKA, ALFRED J. *Elements of physical biology.* xxx + 460 p. 72 fig. Williams & Wilkins Co.: Baltimore, 1925.—The first plan of the work was laid about 1902, in the author's student days in Leipzig; further development appears in his various papers, the 1st of which appeared in 1907 in the *Amer. Jour. Sci.*; and the final consummation of this larger work was carried out at the Johns Hopkins University at the invitation of the Department of Biometry and Vital statistics.—" . . . the term Physical Biology has been employed to denote the broad application of physical principles and methods in the contemplation of biological systems, whereas *Biophysics*, in common parlance, relates rather to the special field of certain physical aspects of the life processes of the *individual* . . . considerable care has been taken to cite in detail the sources consulted . . . at the same time the compilation of anything like a complete bibliography could not be undertaken on the present occasion."—Part I takes up "general principles," discussing definitions, evolution as the history of a system in the course of irreversible transformation, the statistical meaning of irreversibility, evolution conceived as a redistribution, and the program of physical biology.—Part II takes up kinetics, including the fundamental equations of the kinetics of evolving systems and analysis of the growth function.—Part III deals with statics and covers the general principles of equilibrium; chemical equilibrium, as an example of evolution under a known law; interspecies equilibrium; the stage of the life drama; the circulation of the elements—H₂O, CO₂, N, and P cycles; moving equilibria; displacement of equilibrium; and the parameters of state.—Part IV, dynamics, treats of the energy transformers of nature, the relation of the transformer to available sources; the correlating apparatus; extension of the sensuous world picture; the adjusters; and consciousness, its function, origin, and energy relations.—The concluding chapter gives the author's "retrospect and prospect" and includes a tabular synopsis of physical biology.—A detailed analytical synopsis of the 34 chapters is included.—*Frederick V. Rand.*

5790. ROACH, B. M. B. *Physiological studies of soil algae.* (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 489. [1924].

PROTOPLASM, MOTILITY

5791. BROOKS, S. C. *The electrical conductivity of pure protoplasm.* Jour. Gen. Phys. 7: 327-330. 1925.—The electrical conductivity of the plasmodium of the slime mold, *Brefeldia maxima*, which constitutes practically pure protoplasm, was found to be approximately equivalent under normal conditions to that of a 0.00145 N NaCl solution, and about 2.8 times that of the liquid in contact with which it developed. When bathed in 1% sea water, the conductivity was much increased, becoming greater than that of the surrounding fluid.—*O. L. Inman.*

5792. KIHARA, HITOSHI. *The physical nature of protoplasm of the wheats.* (Japanese.) Jour. Soc. Agric. and Forest. [Sapporo, Japan] 15: 55-68. 1923.—The pollen grains of cereal plants burst easily in tap water or dilute solutions. Although this phenomenon depends mostly on their own high osmotic pressure, the colloidal nature of protoplasm also must be considered as an important factor. Pollen-plasm with diminished viscosity shows weak resistance to the inner pressure. On the contrary, if its viscosity is raised, bursting of pollen grains hardly occurs, even with their high osmotic pressure. In the extreme case such dehydration will cause irreversible coagulation of protoplasm.—Applying this bursting phenomenon of pollen grains the writer examined the effects of H-ion concentrations on proto-

plasm of several species of *Triticum*, with special reference to the phylogenetical classification of Schulz. By addition of regulated amounts of HCl or KOH and water to a certain nutrient solution, a wide range in the H-ion concentrations on the acid side was obtained. Bursting of pollen in the hanging drop was observed exactly after 30 minutes, and its grades were indicated by the number of burst pollen grains expressed in percentages. Non-alkaline zeiss cover-glasses were used.—The curves showing percentages of bursting pollen grains in the 3 strains of wheats are different from one another. Generally the pollen grains of the Dinkel group burst most easily, next come those of the 1-grained wheat, and lastly, those of the Emmer group. The difference in osmotic pressure of each strain plays no principal part. In each strain the reaction of pollen protoplasm to H-ion concentrations, that is, the fluctuation of the percentage curve of bursting pollen grains, is almost equal.—In the hybrid generations the reaction of pollen protoplasm to H-ion concentrations shows a tendency toward segregation, together with other morphological characters and number of chromosomes.—*Author.* (Courtesy *Japanese Jour. Bot.*)

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL RELATIONS

5793. BLOTEVOGEL, WILHELM. Der vitale Farbstofftransport im jugendlichen Auge. [The transport of vital stains in young eyes.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen u. Gewebelehre 1: 447-470. 7 fig. 1924.

5794. BLOTEVOGEL, WILHELM. Der Vitale Farbstofftransport während der Zahnentwicklung. (Beiträge zur Kenntnis der Stoffwanderungen bei wachsenden Organismen, II.) [The transport of vital stains during development of the tooth. (The transfer of materials in growing organisms, II.)] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 601-623. 6 fig. 1924.—The amount of stain found in a cell is an index of the amount of intake of food materials into the cell. Trypan blue is found in both ectodermal and endodermal cells in which calcium impregnation has not occurred. Alizarin, on the other hand, stains the calcium salts. Young mice were used as material.—*Ralph E. Cleland.*

5795. COLLINS, GEORGE ERNEST. The swelling of cotton cellulose. A summary of the literature. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 264-276. 1923.

5796. EISLER, BELA. Über die Farbstoffspeicherung im Ovarium der weissen Maus in verschiedenen Alterzuständen. (Beiträge zur Kenntnis der Stoffwanderungen bei wachsenden Organismen, III.) [The storage of stains in the ovaries of white mice of varying ages. (The movement of materials in growing organisms, III.)] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 624-641. 9 fig. 1924.—This is a report upon the degree to which trypan blue, injected into normal animals, is found deposited in the various tissues of the ovary.—*Ralph E. Cleland.*

5797. ERNST, PAUL. Adsorptionserscheinungen an Blutkörperchen und Bakterien. [Adsorption phenomena on blood corpuscles and bacteria.] Beiträge Path. Anat. 69: 152-162. Pl. 6, 1 fig. 1921.—This article is mainly a study of the phenomenon of adsorption of metallic silver particles on the surfaces of red blood corpuscles. In the light of earlier work by the same author this study was extended to include the behavior of several kinds of bacteria and the hyphae of *Nectria moschata* towards colloidal silver solutions (Kollargol and Protargol). The author found that silver particles were adsorbed by the bacteria in much the same manner but that the pattern of arrangement of the particles on the surfaces is specific, it being possible to distinguish the different kinds of bacteria by this method; and that the fungus membrane is permeable to the colloidal silver, since intracellular adsorption of the silver particles by preëxisting bodies within the intracellular vacuoles takes place. Considerable space is devoted to the discussion of adsorption.—*Louise Dosdall.*

5798. HARVEY, ELLERY H. Some physico-chemical properties of starch. I. Amer. Jour. Pharm. 96: 752-758. 1924.—A rather extensive review of the literature on starch by the author revealed the fact that there was a lack of the more important physico-chemical constants of commercial starches. The starches investigated by the author include those of potato, corn, and cassava. The list of constants determined consists of the following: specific gravity, moisture, ash, heat of combustion, acidity, size, gelatinizing temperature, gold number, cataphoresis, specific heat, vapor tension above starch solutions, ignition tem-

perature, dielectric constant; refractive index, rapidity of settling; and polariscopic determination.—*Anton Hogstad, Jr.*

5799. HARVEY, ELLERY H. Some physico-chemical properties of starch—II. *Amer. Jour. Pharm.* 96: 816-822. 1924.—This is a continuation of investigations dealing with the physico-chemical properties of starch, in which are recorded such constants as hygroscopicity; viscosity, surface tension, and specific gravity of cassava starch suspensions.—*Anton Hogstad, Jr.*

5800. HARVEY, ELLERY H. The electro-dialysis of agar. *Amer. Jour. Pharm.* 97: 66-70. *Fig. 1.* 1925.—This report concerns itself with an attempt to prepare an ash-free agar by electro-dialysis, preliminary to a review of its physico-chemical properties. The "reduced-ash" agar as prepared by a method given by the author, had the appearance of high grade sheet gelatin—moisture content 12.28%; ash 0.81% on a moisture-free basis; pH value of 4.9 in a hot 1% sol.—The "reduced-ash" agar when subjected to kataphoresis, was found to be electro-negative. In relation to the effect of pH on the viscosity, it was found that the agar sol reaches a maximum viscosity at the point of neutrality. The results of the author's experiments on the effect of salts on viscosity indicated that as the percentage of the neutral salt is increased, the viscosity is decreased. A bibliography is given.—*Anton Hogstad, Jr.*

5801. HILL, A. V. The potential difference occurring in a Donnan equilibrium and the theory of colloid behaviour. *Proc. Roy. Soc. London A*, 102: 705-710 (*Ibid. B*, 94: 455, abstract) 1923.—It is contended by Loeb that the Donnan membrane equilibrium, involving the presence of an indiffusible ion, is the basis of the colloidal properties of a protein solution. While the possibility of this conclusion is admitted, it is pointed out that one of the chief arguments employed in its favor by Loeb is incorrect. Loeb shows that the potential difference observed experimentally between a protein and a non-protein solution separated by a membrane agrees very exactly with that "calculated" from the difference in hydrogen-ion concentrations, also observed experimentally, and concludes that this supports his theory. As a matter of fact, this equality is a necessary and inevitable consequence of the manner in which his observations were made and of general thermodynamical reasoning, and its proof is independent of any theory of the mechanism by which the potential difference is produced.—*Author's conclusion.*

5802. HOLKER, J. The periodic opacity of certain colloids in progressively increasing concentrations of electrolytes. *Proc. Roy. Soc. London A*, 102: 710-734. (*Ibid. B*, 94: 455, title only) 1923.—The method used in this investigation has been previously published (HOLKER, J. *Methods of measuring the capacity of liquids. Pt. I. Biochem. Jour.* 15: 216-225. *Fig. 1-3*, 1921).—The following points were studied: The periodic opacity of human serum in progressively increasing concentrations of NaCl, and the influence of certain factors thereon: the opacity of serum diluted with various electrolytes; the periodic opacity of various colloids and of certain mixtures of aqueous solutions of the inorganic salts found in serum.—The author states that in the periodic opacity and in the periodic law of elements the periodicity is associated with a progressive increase in the number of protons and electrons. The periodic opacity phenomenon is more pronounced in the presence of relatively small concentrations of ions, and falls away with increasing concentrations of ions; again, the periodic variation in opacity of colloids means that the total surface area of the colloid scattering light, varies in a periodic manner. It has been shown by W. L. Bragg that the diameter of atoms, and therefore their surface area also, varies in a periodic manner. It is evident, therefore, that the characteristic common to both phenomena is that the periodicity is predominantly associated with surface area and surface constitution.—*Frederick V. Rand.*

5803. MÖLLENDORFF, WILHELM VON. Beiträge zur Kenntnis der Stoffwanderungen bei wachsenden Organismen. [The movements of materials in growing organisms.] *Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre* 1: 445-447. 1924.—This is an introduction to a series of papers on the permeability of certain tissues to vital stains.—*Ralph E. Cleland.*

5804. MUDD, STUART, AND EMILY B. H. MUDD. The penetration of bacteria through capillary spaces. III. Transport through Berkfeld filters by electroendosmotic streaming.—*Jour. Bact.* 9: 151-167. 1924.—Experiments are reported in which a filterable microorganism, *Vibrio parcolans*, was drawn through artificial membranes by electroendosmotic streaming.

The membranes were Berkefeld "V" filters. Their wall thickness was about 0.4 cm. Their pores were irregular and tortuous, narrowing down to minimal diameters of about 0.4 microns. The difference in potential across the membranes varied from 10 to 70 volts. The source was carbon electrodes connected to the laboratory 220-volt direct current line. The endosmotic transport of fluid across the filter under these circumstances was 2-3 cc. per minute. The pressures developed were those of 60-200 cc. of water. *V. percolans* is negatively charged relative to its medium, and thus tends to move by cataphoresis to the anode. Water streams by endosmosis through the negative filter pores to the cathode. The resultant movement of the microorganisms under the combined influence of cataphoresis and endosmosis is in this case with the endosmotic stream to the cathode. Appearance of the vibrios in the filtrate about the cathode is much quicker than when they penetrate the filter by their own motility alone and somewhat slower than when they are filtered by suction. These results are in qualitative agreement, at least, with the equations of the Helmholtz-Smoluchowski theory. Possible applications of this mechanism of electroendosmosis and cataphoretic movement are indicated in relation to penetration of bacteria through the epithelia and in relation to secretion and resorption.—*Author's summary.*

5805. SHAUGHNESSY, H. J., AND I. S. FALK. The effects of some electrolytes on the buffering capacity of *Bacterium coli*. Jour. Bact. 9: 559-579. 1924.—In distilled water, *Bacterium coli* possesses distinct buffering capacities which are greatest in the most favorable zone for viability—pH 6-6.9, and significant in the range which is of physiological importance—pH 4-10. Above pH 10 and below pH 4 the buffer ratio approximates unity and further may be so far below unity as to suggest that there is actual liberation of, rather than reaction with, the H or OH ion which predominates in the surrounding medium. The existence of a 2nd, alkaline isoelectric range is suggested because the buffer becomes insignificant several pH units away from the acid isoelectric point (which is below pH 1.0 for this strain) and likewise insignificant at certain alkaline pH values.—In NaCl solutions the buffering capacities were depressed with all strengths used (0.0725 M-1.450 M); but it seems that the breadth of the significant buffer zone and the magnitudes of the individual ratios increase as the dilution increases up to the point of just appreciable toxicity of the salt for the bacteria. Beyond that point the buffer is somewhat increased but is still lower than the buffer in distilled water or in very dilute NaCl solution. In these concentrations it is probable that we are dealing with unorganized cell constituents rather than with bacterial cells.—In CaCl₂ solutions (0.0145 M-0.290 M) the buffering capacities were practically abolished in all solutions which were non-toxic at favorable pH. It is possible that there is an appreciable buffer in the pH zone 5-5.9 in the most dilute solutions (0.00725 M). The toxic concentration showed the same increase in buffer as did the toxic concentration of NaCl and probably for the same reason. The "physiologically balanced" solution of NaCl + CaCl₂ (0.580 M + 0.145 M) showed no material increase in buffering capacities over that of the solution containing CaCl₂ alone.—*Authors' summary.*

5806. SHIBATA, FUJI, AND KENSHO KIMOTSHUKI. Ueber die Absorptionsspektren der Pflanzenfarbstoffe der Flavonreihe. I. [The absorption spectra of plant pigments of the flavon series.] Acta Phytochim. 1: 91-104. 2 pl. 1923.

5807. WENTZLAFF, ADALBERT. Untersuchungen über die Vitalfärbung an Froschlungen. [Researches upon the vital staining of frog's lungs.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 562-589. 7 fig. 1924.—A large number of vital dyes, both basic and acid, were used, and among other phenomena, the permeability of the various tissues of the lungs to these dyes was studied. The use of secondary stains, following the general staining process, yielded interesting results.—*Ralph E. Cleland.*

WATER RELATIONS

5808. EVE, A. S. Flow of sap in trees. Nature 114: 827. 1924.—Reference is made to a comment by Charles Darwin upon sap flowing from the upper end of palm trunks cut to lie up-slope.—*O. A. Stevens.*

5809. FARROW, FREDERICK DENNY, AND ENOCH SWAN. The absorption of water by dried films of boiled starch. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 465-474.

Fig. 1-5. 1923.—Thin films of cooked starch have been obtained by the evaporation of pastes made under varying conditions. These films have been dried and the dry material caused to absorb water by exposing them to atmospheres of controlled humidity. The resulting absorption has been estimated by weighing the specimens from time to time. In other experiments, a known amount of water has been permitted to evaporate onto a starch film contained in an evacuated vessel. The final pressure and consequently the relative humidity attained after each addition of water has been measured. Wet starch persistently retains more water than it would have absorbed if introduced dry into the same atmosphere. Prolonged heat treatment reduces the capacity which starches possess of absorbing water. Films prepared from different (botanical) varieties of starch have very similar powers of absorbing water. The possible bearing of these results on the extent to which sized warps should be dried is indicated.—*Authors' summary.*

5810. GALLOWAY, W. **Capillary action: transpiration.** *Nature* 114: 933. 1 fig. 1924.—An apparatus to illustrate the movement of water is described.—O. A. Stevens.

5811. WALDERDORFF, MARIA GRAEFIN. **Ueber Kultur von Pollenschläuchen und Pilzmycelien auf festem Substrat bei verschiedener Luftfeuchtigkeit.** [Cultures of pollen tubes and mycelia under different humidity conditions.] *Bot. Archiv.* 6: 84-110. *Fig. 1-18.* 1924.—Pollen germinates better near a solution rather than in it. Branching of pollen tubes behaves similarly. That concentration of sugar which is best for the germination of pollen tubes in the solution is from 0.1 to 0.2 g.m. In pollen grains with several tubes the nucleus lies in the grain; in the case of branched tubes the nucleus lies behind the point of branching. The highest osmotic pressure at which tubes will grow is seldom more than 1.0 g.m. of NaCl, about 45 atmospheres, and usually 0.5 to 0.7 g.m., about 22.5 to 31.5 atmospheres. Fungi such as *Penicillium* can grow at a concentration of 0.4 g.m. of NaCl, 217 atmospheres, while *Phycomyces* can grow only between 0.6 (*Chaetocladium*) and 3.1 g.m., of NaCl, (*Absidia*) about 26-155.5 atmospheres.—William Seifriz.

MINERAL NUTRIENTS

5812. BRINK, R. A. **Preliminary study of role of salts in pollen tube growth.** *Bot. Gaz.* 78: 361-377. 1924.—The investigation is designed to show the relation of electrolytes to pollen tube growth. In most of the experiments the pollen of sweet pea was used. The pollen was grown in sealed drop cultures at 25°C., a 15% sucrose solution being the basic medium. It has been found that 0.01 M NaCl added to the sucrose solution inhibits germination entirely. A concentration of 0.0002 M NaCl reduces the growth of the pollen tube 15%. MgCl₂ and BaCl₂ are about 15 times as toxic as NaCl. The presence of Ca salts in concentrations 0.02 M to 0.002 M causes the growth of the pollen tube to be markedly enhanced. This is probably due to the role of Ca in preserving normal permeability rather than its function as a true nutrient.—L. J. Pessin.

5813. ESCHENHAGEN, MAX. **Ueber den Verlauf der Kaliumaufnahme junger Roggenpflanzen, die in einem unverhältnismässig kleinen Bodenvolumen gewachsen sind.** [Potassium consumption of rye.] *Bot. Archiv.* 7: 418-448. 1924.—Potassium consumption is not a function of K supply but of the concentration of K in solution.—William Seifriz.

5814. HARRIS, J. ARTHUR, JOHN V. LAWRENCE, AND ZONJA WALLEN LAWRENCE. **The chlorid content of the leaf tissue fluids of Egyptian and Upland cotton.** *Jour. Agric. Res.* 28: 695-704. 1924.—Studies on varieties of Egyptian and Upland cotton show that the leaf tissue fluids of the Egyptian cotton contained larger quantities of chloride than those of Upland plants grown under comparable conditions.—J. Arthur Harris.

5815. LICHTIN, AARON. **The iron content of spinach.** *Amer. Jour. Pharm.* 96: 361-364. 1924.—Analyses of a number of varieties of spinach are given, along with a quantitative method for the determination of iron in this plant. Of the market varieties, Long Standing was found to be the richest in iron content (0.00867%) and New Savoy the poorest (0.00267%). The average content of truck spinach used in the investigations was found to be 0.00512%; of dehydrated, 0.056832%; of canned 0.000760%.—Anton Hogstad, Jr.

5816. PFYL, B., UND W. SAMTER. **Über die Alkalität der Asche von Lebensmitteln.** [Alkalinity of the ash of foodstuffs.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 46: 241-

275. 1923.—An improved method of determining alkali and phosphates in foodstuffs is described. Phosphates are determined by a method in which tri-calcium phosphate is precipitated so as not to be noticeably hydrolyzed. By a modification of this process the alkali and phosphate may be separated from common ash constituents such as Fe, Zn, Pb, Sn, Mn, Al, and borates and silicates. Titration methods are given for the determination of Mn, Fe, Al, Zn, Pb, and boric acid in combination with alkali and phosphate in the ash; also a rapid titration method for Ca in ash.—*F. S. Bukey.*

PHOTOSYNTHESIS

5817. WALLER, J. C. Photo-electric changes in green and white leaves. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 488. [1924.]

METABOLISM (GENERAL)

5818. ASAHINA, YASUHIKO. Chemische Untersuchungen der Frucht von *Evodia rutaecarpa*. [Chemical investigation of the fruit of *Evodia rutaecarpa*.] Acta Phytochim 1: 67-89. 1922.

5819. AUERBACH, FRIEDRICH, UND DEODATA KRÜGER. Die polarimetrische Bestimmung der Äpfelsäure. [Polarimetric estimation of malic acid.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 97-154. Fig. 1-9. 1923.

5820. AUERBACH, FRIEDRICH, UND DEODATA KRÜGER. Bestimmung von Äpfelsäure in Fruchtsäften und anderen Fruchterzeugnissen. [Determination of malic acid in fruit-juices and other fruit-products.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 177-217. 1923.

5821. BEYTHIEN, A., UND P. PANNWITZ. Unliebsame Folgen der Vitaminforschung. [Unfortunate consequences of vitamin investigation.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 309-314. 1923.—Investigations of certain German proprietary vitamin preparations are reported. Extensive use and advertising of products of this sort may lead consumers to overlook the essentials of a normal diet with respect to vitamin-content.—*F. S. Bukey.*

5822. CLIBBENS, DOUGLAS ARTHUR, AND ARTHUR GEAKE. The chemical analysis of cotton. II.—The determination of copper number. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 15: T 27-38. 1924.—Some of the proposed methods in use for determining the copper number of modified or unmodified cotton cellulose have been compared, with the object of selecting one which best fulfils the conditions. A method described by Braidy, and by Koehler and Marqueyrol, has been found satisfactory after critical examination, and a detailed account of it is given. It differs from other methods in avoiding the use of Fehling's solution, which is replaced by a less strongly alkaline reagent. The method gives very low and constant copper numbers for pure cotton cellulose, is very sensitive to slight modifications of the cotton by acids or oxidising agents, and yields results which can be accurately duplicated. A number of determinations are recorded which illustrate its value as a standard method.—*From authors' abst.*

5823. CLIFFORD, PERCY HERBERT, AND ROBERT GEORGE FARCHER. A comparison of the volatile products derived from cotton by the action of water, and of sodium hydroxide, at 40 lbs. pressure. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 117-124. 1923.—The small quantity of volatile products eliminated from cotton by distillation in steam or by the action of water or alkalis on the minor constituents present have been largely unidentified. The authors' investigations indicate 3 classes of substances. The volatile neutral products soluble in water obtained by treatment with sodium hydroxide, were primarily methyl alcohol and acetone, with smaller quantities of a variety of other compounds. The 2 first products mentioned suggest the presence of pectin in cotton. In the 2nd class are included volatile products immiscible in water. This group of products was separated by distillation in steam into 2 fractions, the less volatile one, an aldehyde or ketone, $C_{10}H_{20}O$, and a more readily volatile portion which proved entirely unreactive toward the usual reagents for the identification of alcohols, aldehydes, or ketones. The volatile bases constituted the 3rd group. Among these, ammonia and small quantities of dimethylamine, trimethylamine, and pyrrole prevailed.—*B. M. Duggar.*

5824. CROZIER, W. J. On the possibility of identifying chemical processes in living matter. Proc. Nation. Acad. Sci. [U. S. A.] 10: 461-464. 1924.—Although the velocities of various vital processes are known to correspond to equations of chemical dynamics, those equations are general and do not identify the specific reactions concerned. An important further advance seems possible, however, on the basis of the magnitude of the critical temperature increment, μ , or E in Arrhenius' equation for the relation between temperature and the velocity of a monomolecular reaction, involving $-E/RT$, where R is the gas constant, T is the absolute temperature, and E is an energy constant characteristic of the reacting substance. It has been established that many chemical reactions of the same kind have the same critical increment, and "that in simple chemical processes the magnitude of E is a function of the particular catalyst." The author finds that the values of μ for various vital processes fall into groups, each group presumably referable to a particular catalyst; similar vital processes are characterized by identical values, often with a characteristic shift at a certain critical temperature. For cell respiration, the known values of μ are all either 11,500 calories (presumably referable to the OH ion) or $16,700 \pm$ calories (probably involving "a dehydrogenating system of the sulphhydryl type"); some cases of respiration give 16,140 calories, the value for oxidation of Fe^{II} to Fe^{III} . This procedure seems to provide a means for the identification of chemical reactions in undisturbed living matter.—Howard B. Frost.

5825. ENGLIS, DUANE T., AND CEDRIC HALE. The occurrence of free pentoses in plants. The effect of extraction of the sugars with ammoniacal alcohol. Jour. Amer. Chem. Soc. 47: 446-449. 1925.

5826. GRIEBEL, C. Mikrochemischer Nachweis von Acetaldehyd in Früchten. [Microchemical demonstration of acetaldehyde in fruits.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 438-441. Fig. 1-2. 1924.—Service-berries (*Pyrus* (*Sorbus*) *domestica* Smith), apples (*Pyrus Malus* L.) and peaches (*Amygdalus Persica*) contain traces of acetaldehyde, especially when over-ripe. The object under investigation is placed in the bottom of a cylindrical beaker above which is placed a cover-glass holding a hanging-drop of a freshly-filtered solution of p-nitrophenylhydrazine chloride in 15% acetic acid. The beaker is gently warmed, and the hanging-drop becomes turbid with a microcrystalline precipitate of yellow, prismatic, often curved needles of acetaldehyde-p-nitrophenylhydrazone.—The crystals are figured.—E. E. Stanford.

5827. HALL, IVAN C., AND EMELIA PETERSON. The discoloration of brain medium by anaerobic bacteria. Jour. Bact. 9: 211-224. 1924.—The blackening of culture media made from the brains of animals is due to the formation of H_2S which unites with iron compounds in the brain tissue, or in some brands of peptone.—C. E. Skinner.

5828. KOESTLIN, HELMUT. Zur physiologischen Anatomie gelber Ranunculus-Blüten. [Physiological anatomy of yellow Ranunculus flowers.] Bot. Archiv. 7: 325-346. Fig. 1-5. 1924.—Under anaesthesia, the carotin chromoplasts of the epidermis of floral leaves of *Ranunculus* disorganize and the carotin is dissolved in large oil masses which are simultaneously formed. In the subepidermis a thick massing of small starch grains is typical, the production of which cannot be experimentally hindered. The starch is consequently not a reserve supply. Isolated starch can be broken down with either wheat diastase or the diastatic enzyme from foliage leaves of *Ranunculus*. The foliage leaves are very rich in reduced sugars.—William Seifriz.

5829. LANGWILL, BERTHA. The character of acids produced by hemolytic and non-hemolytic streptococci from pathogenic sources and from milk. Jour. Bact. 9: 79-94. 1924.—During the 1st 24 hours of growth in a sucrose or lactose broth, the acid production by non-hemolytic streptococci was found to be nearly twice as great as the acid produced by hemolytic streptococci. Titratable acidity and H-ion content are only comparable in cultures grown in the same lot of broth and during early stages of fermentation. Later, total acidity was about equal, but the hemolytic strains had a higher ratio of non-volatile to volatile acid. The non-volatile acid was almost entirely lactic acid of the racemic type. Non-hemolytic streptococci produced formic and acetic acids. The hemolytic organisms and *Streptococcus viridans* formed acetic and propionic acids. Neither organism produced more than traces of butyric acid. Streptococci, isolated from similar pathogenic lesions or bearing like specific names,

showed no constancy of ratio between volatile and non-volatile acids which they produced.—*Author.*

5830. MAJIMA, RIKO, AND CHIKA KURODA. On the colouring matter of *Lithospermum Erythrorhizon*. *Acta Phytochem.* 1: 43-65. 1922.

5831. OMEIS, TH. Über den Einfluss des Jahrganges und der Düngung auf die Qualität bezw. auf Zucker- und Säuregehalt des Weines. [Influence of season and fertilization on sugar and acid-content of wine.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 47: 132-135. 1924.

5832. PORTIER, P. Les vitamines, applications pratiques. [Vitamins, practical applications.] *Rev. Scientifique* 62: 740-746. 8 fig. 1924.—This is a general account of vitamin needs and of some of the results and causes of vitamin variation in certain foods or food materials.—A. E. Hitchcock.

5833. RALSKI, EDWARD. Bielma miekkie a zawaytość Tluszczu w nasionach. ["Soft" endosperms and the content of oil in seed.] *Kosmos*. [Leopol] 49: 41-51. 1924.—The author discusses the part played by oils in the seed of Gramineae, summarizing the works concerning the properties of oils in seed in general and their relation to starch. It is an introduction to the author's own observations.—H. Czeczott.

5834. RALSKI, EDWARD. Tłuszcze w ziarnach traw. [The fat bodies in the seed of Gramineae.] *Kosmos*. [Leopol] 49: 62-99. 2 pl. 1924.—The differences in quantity and distribution of fatty bodies in the seed of grasses is related to the nature of the starch present in the particular species. Seed with simple starch grains exhibit fat only in the embryo and in the aleurone layer. In seed with compound starch grains, the fat bodies occur also in the endosperm, except in those of vitreous nature. On the contrary, it occurs where the endosperm is farinaceous and contains compound starch grains.—At times the fat content in the endosperm is very large, the latter being often filled with a semi-liquid mass of the fat and other materials, the cells of the tissues often disintegrating. The content of the endosperm of many non-fatty Gramineae exhibits an acid reaction, even in the resting seed, whereas other fatty seed react neutral ordinarily, and acid during germination.—Some interesting varieties with non-fatty seed are acid or indifferent during germination, the former germinating perfectly in the dark, the latter not at all under similar conditions.—The author has noted some interesting changes during the germination of those with simple starch grains; in such cases the fat is easily perceivable, though existing in small quantity. The author assigns to the fat not only a food value but also a biological importance which cannot be replaced. Probably the latter depends chiefly upon the enzyme content and the presence of substances of the nature of vitamins. For this reason all the seed contain a certain quantity of "active fat," ordinarily in the germ. In no seed is there less than a minimum of fat. Although starch or protein may replace some of the fat, neither may replace this "active" material.—From author's French résumé.

5835. REID, MARY E. Quantitative relations of carbohydrates to nitrogen in determining growth responses in tomato cuttings. *Bot. Gaz.* 77: 404-418. Fig. 1-8. 1924.—A high nitrogen supply plus a readily available (even though somewhat limited) supply of carbohydrates appears to furnish favorable conditions for shoot growth. The same also appears true for root growth. There seems to be a greater utilization of the carbohydrate reserves in carbohydrate-high cuttings grown in light than in those grown in darkness, and the utilization is greater in the cuttings grown in the solution plus nitrates than in those grown in the solution minus nitrates. A synthesis of nitrogenous materials that may be used in growth appears to occur in cuttings grown both in light and in darkness, but such synthesis appears to be greater in amount in light than in darkness. Light is particularly favorable for the growth of shoots. The cuttings have a tendency to do what the plant has been doing, that is, if the plant were producing shoots abundantly, and roots to a relatively smaller extent, the cutting tends to do likewise.—M. E. Reid.

5836. SHIBATA, KEITA, SHOJURO IWATA, UND MAKOTO NAKAMURA. Untersuchungen über des Baicalin, eine neue Flavon-Glucuronsäure-Verbindung aus den Wurzeln von *Scutellaria baicalensis*. [Baicalin, a new flavon-glucuronic acid compound from *Scutellaria baicalensis*.] *Acta Phytochim.* 1: 105-139. 1 pl. 1923. (Courtesy Japanese Jour. Bot.)

5837. WURDACK, JOHN H. The natural plant coloring matters. Jour. Amer. Pharm. Assoc. 13: 307-315, 399-406. 1924.—This is a review of our present knowledge concerning the natural plant coloring matters. The paper deals with the chlorophylls, carotinoids, anthocyanins, and spring and autumn leaf coloration, with a brief mention of phycoerythrin and phycophaein.—*Anton Hogstad, Jr.*

5838. ZIEGENSPECK, HERMAN. Milchsäfte und Schleime. [Latex and mucilaginous substances.] Bot. Archiv. 7: 141-174. 1924.—The significance of latex tubes and mucilaginous juices is associated either with protection or metabolism.—*William Seifriz.*

5839. ZIEGENSPECK, H. Ueber Sparstärke. [Starch.] Bot. Archiv. 7: 251-273. 1924.—Differences in the digestibility of starch from different sources by the same diastase may be due to chemical differences of the starches, which, in turn, may be due either to differences in structure of the starch grain or merely to closer packing of the individual particles. The permeability for diastase of the plasma layers immediately surrounding the starch grain, plays an important role in digestibility.—*William Seifriz.*

METABOLISM (NITROGEN RELATIONS)

5840. ANONYMOUS. [Rev. of: GUGGENHEIM, M. Die Biogenen Amine und ihre Bedeutung für Physiologie und Pathologie des pflanzlichen und tierischen Stoffwechsels. (Biogenic amines and their significance in plant and animal physiology and pathology.) (Monographs in plant and animal physiology. Vol. 3) 2d. ed. viii + 474 p. Julius Springer: Berlin, 1924.] Nature 114: 927. 1924.

5841. ANONYMOUS. [Rev. of: OSBORNE, T. B. The vegetable proteins. (Monographs on biochemistry) 2d ed. xiii + 154 p. Longmans Green & Co.: London, 1924.] Nature 114: 822. 1924.

5842. ALFA, J., UND E. HEYL. Kartoffeln 1922-er Ernte mit ausserordentlich hohem Solaniningehalt. [Potatoes of the 1922 harvest with unusually high solanin content.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 306-309. 1923.—Several outbreaks of illness are traced to the use of potatoes [*Solanum tuberosum*]. Samples of these potatoes showed a solanin content of 100-400 mg. per kgm. Investigation of this high solanin content is being undertaken.—*F. S. Bukey.*

5843. CALVINO, EVA MAMELI. Sobre la asimilacion directa del nitrogeno libre por las plantas. [Direct assimilation of free nitrogen by plants.] Estac. Exp. Agron. [Cuba] Circ. 59. 3-7. 1923.—The author reviews the more recent works on the subject of direct assimilation of free nitrogen by plants, with particular reference to her own work and that of her collaborator, G. Pollacci.—*John A. Stevenson.*

5844. ECKERSON, SOPHIA H. Protein synthesis by plants. I. Nitrate reduction. Bot. Gaz. 77: 377-390. 1924.—Reduction of nitrate to nitrites and ammonia was obtained by tomato plant extract in slightly alkaline solution in the presence of fructose or glucose and some free oxygen, in darkness as well as in light. The reduction was most active in solutions of approximately pH 7.6. The expressed juice of nitrogen-high tomato plants (containing both nitrates and sugar in abundance), after adding N/10 NaOH to bring to pH 7.6, gave a very rapid reduction of nitrates to nitrites at 50°C. The expressed juice of carbohydrate-high tomato plants (containing much sugar but no nitrates), brought to pH 7.6, gave no reaction for nitrites after 20 hours at 50°C. Upon addition of nitrates there was even more rapid reduction than by the nitrogen-high juice. Tomato plant juice, boiled and brought to pH 7.6, reduced nitrates as rapidly as the unheated juice. The rate and amount of reduction of nitrates to nitrites by tomato plant extract were exactly the same in darkness as in light. Probably the rate of reduction of nitrates to nitrites by carbohydrate-high tomato plants in darkness was the same as in light for the 1st few days. Then disturbing differences appeared which are not yet understood. In carbohydrate-high tomato plants the reduction of nitrates was localized in the following regions: at the stem tip just behind the growing region; in the leaf cells, especially near the phloem, and in the cortical cells of the petioles; in the stem, especially near the nodes, in the phloem parenchyma, and in cells in the cortex near the phloem. All these regions were slightly alkaline in reaction. The pith cells were acid. In the carbohydrate-high plants before nitrate was supplied there was less difference. The

pith cells were slightly acid while the phloem parenchyma was about neutral in reaction. Amino acids (newly synthesized) appeared at the nodes and in petioles and blades of young leaves and just behind the stem tips of carbohydrate-high tomato plants 3-4 days after nitrate had been supplied to the soil. The amino acids were aspartic acid, asparagin, alanine, leucine, cystine, and histidine.—*Sophia H. Eckerson.*

5845. GORTNER, ROSS AIKEN, AND WALTER F. HOFFMAN. Evidence of a new amino acid in proteins. Jour. Amer. Chem. Soc. 47: 580-585. 1925.—The new amino acid was isolated from the protein teozein. The present evidence points to the empirical formula, $C_4H_{11}O_3N$, or some multiple of this.—*J. M. Brannon.*

5846. GOWDA, R. NAGAN. Nitrification and the nitrifying organisms. I. Jour. Bact. 9: 251-272. 1924.—The author was unable to isolate either *Nitrosomonas* or *Nitrobacter* in pure culture, but concluded that "the nitrite formers may rapidly lose their power of oxidation when grown in pure culture." Free CO_2 is essential and a stream of CO_2 was found superior to air. The carbonaceous material in soil-extract is not able to serve as a source of carbon to the nitrifying organisms when CO_2 is excluded, although soil-extract agar is a good culture medium for impure cultures of the ammonia oxidizing bacteria. Species of *Actinomyces* were the most common contaminants in the cultures.—*C. E. Skinner.*

5847. GRIEBEL, C. Zum Solanin gehalt der Kartoffeln 1922-er Ernte. [Solanin content of potatoes harvested in 1922.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 47: 436-438. 1924.—Exposure of potatoes (*Solanum tuberosum*) of normal solanin content to bright sunlight for 4 days, more than doubled the solanin content. A dangerous increase in solanin content may occur through the influence of light too weak to cause noticeable chlorophyll formation. The numerous instances of potato-poisoning following the 1922 harvest are attributed to exposure of potatoes to light.—*E. E. Stanford.*

5848. KLOTZ, L. J. Studies in the physiology of the fungi. XVI. Some aspects of nitrogen metabolism in fungi. Ann. Missouri Bot. Gard. 10: 299-368. Fig. 1-23. 1923.—A rather extensive review of the literature on the N-metabolism of fungi is included in this study of certain phases of assimilation and excretion of N by fungi. The 3 fungi, *Aspergillus niger*, *Sphaeropsis Malorum* and *Diplodia natalensis*, were used in the experimental work. These were grown on Duggar's nutrient solution for fungi, with variations in the N-containing constituents so as to give 5 different kinds of media. Methods of culture and inoculation are described. At various growth intervals "five cultures of each medium were analyzed, determinations being made of the dry weight and percentage N of the fungous crop, and hydron concentration, sugar, NH_3 plus NH_4N , total N, NO_3N , NO_2N , total amino N, acid amide N, and peptid N of each of the culture fluids. Near the end of each experiment entire cultures, including the mat and medium, were Kjeldahlized to ascertain the loss or gain of N and the presence or absence of the capacity of the fungi for N fixation under the conditions employed." Methods employed in these analyses are described. The results are summarized as follows: "Autolysis is at first indicated by decrease in dry weight of the fungus mat from a maximum and by the formation of NH_3 in the peptone and KNO_3 media; somewhat later, by increase in total N of the culture solution from a minimum in all the media, and by the appearance of a trace of amino N in the 3 inorganic nitrogenous media. Autolysis in a species is proportional to the rate and amount of growth attained. Ammonia is the chief nitrogenous product of autolysis and is a waste product of the splitting of the pepton of the media in the absence of another C source. In the presence of dextrose, NH_3 was reassimilated. Disappearance of carbohydrate from the culture medium is synchronous with the beginning of autolysis. In cultures whose H-ion exponent becomes greater than pH 7.0 the loss of N is due to the evolution of NH_3 . Conditions necessary to the formation of crystals of $MgNH_4PO_4 \cdot 6H_2O$ and $Mg_3(PO_4)_2 \cdot 4H_2O$ in the cultures were determined. The probable causes of the shifting of the H-ion concentration of the media are discussed. Nitrogen of the amino group is readily assimilated by the fungi studied. Some factors influencing the N content of the fungous mat are the N and C sources of the medium, the length of incubation, rate of growth, and H-ion concentration. The organisms displayed markedly different physiological relations; this was indicated by their rates of growth and of sugar consumption, by their utilization and excretion of the several forms of N, and by the varying nature and extent of H-ion change of the medium."—*S. M. Zeller.*

5849. LAMSON, R. W. The Van Slyke method for the determination of amino-acid nitrogen as applied to the study of bacterial cultures. Jour. Bact. 9: 307-313. 1924.—The present methods used for the quantitative estimation of amino acid N by the Van Slyke technique are not altogether satisfactory. The author stresses the fact that students of bacterial physiology are dependent upon the chemists for the development of new methods.—C. E. Skinner.

5850. SHELTON, ELBERT M., AND TREAT B. JOHNSON. Researches on proteins. 7. The preparation of the protein "Sericin" from silk. Jour. Amer. Chem. Soc. 47: 412-418. 1925.

5851. SORESENSEN, S. P. L. The solubility of proteins. Jour. Amer. Chem. Soc. 47: 457-470. 1925.

5852. TAGUE, E. L. The iso-electric points of gliadin and glutenin. Jour. Amer. Chem. Soc. 47: 418-422. 1925.

5853. TRUFFAUT, GEORGES. Le Cycle biologique de l'azote. [The biological cycle of nitrogen.] Jardinage 12: 115-119. 1925.—Three figures show the greater size of shoot, tassel and roots of corn, *Zea mais*, that had been inoculated with nitrogen fixing bacteria.—L. Pace.

METABOLISM (ENZYMES, FERMENTATION)

5854. ANDÔ, KEIZABURÔ. Supplementary observations on the substances increasing yeast fermentation. (Japanese.) Japanese Jour. Exp. Med. Sci. 8: 19-87. 1923.

5855. HARVEY, ELLERY H. Efficiency of some organic dyes as antiferments. Amer. Jour. Pharm. 96: 585-589. 1924.—This is a continuation of the author's investigation of substances used as antiferments, and deals with a study of the use of safranin, paranitrophenol, methylene blue, eosin Y, aniline methyl violet, cyanine, acid fuchsin and alizarin blue S. Employing the fresh yeast method devised by the author, all of the dyes examined except alizarin blue S showed some anti-ferment value under the conditions described, several ranking well up in the list with more commonly used chemicals. In the chart given by the author, including various antiferments, we find the following: (the comparison being with mercuric chloride, 100% efficiency) safranin 57.3; paranitrophenol 56.2; methylene blue, 43.7; eosin Y, 32.2; anilin violet (methyl), 26.2; cyanin, 18.5; acid fuchsin, 16.3; and alizarin blue S, 00.0. A bibliography is included.—Anton Hogstad, Jr.

5856. LEVINE, MAX, AND F. W. SHAW. Further observations on liquefaction of gelatin by bacteria. Jour. Bact. 9: 225-234. 1924.—Stored gelatin media may be rendered constant in viscosity readings by preheating to 50°C. before making readings. Gelatin may be stored at 41°C. for 10 days without changing the viscosity. Viscosity changes and formol titrations were measured for a non-liquefying organism, *Bacterium aerogenes*, and for a strongly proteolytic one, *Erythrobacillus prodigiosus* (*Bacterium prodigiosum*).—C. E. Skinner.

5857. LISK, HENRIETTA. A study of the decomposition products of spore-bearing bacteria in heated milk. Jour. Bact. 9: 1-12. 1924.—A quantitative study of the protein decomposition products of the following organisms is reported: *Bacillus cereus*, *B. albolactis*, *B. megatherium*, *B. simplex*, *B. mesentericus*, *B. subtilis*, and *B. brevis*.—C. E. Skinner.

5858. NEMEC, ANTONIN, ET FRANTISEK DUCHON. Sur une nouvelle méthode biochimique pour la détermination de la faculté vitale des semences. [A new method for the determination of the vital activity of seed.] Ann. Sci. Agron. Française et Étrangère. 40: 121-150. 1923.—This paper is concerned chiefly with a biochemical method for the determination of the vital activity of seed, this method being based on catalase activity as indicative of vital activity.—A large number of grains with different germination capacities were studied with regard to catalase activity and in all cases a correlation between catalase activity and germination percentage was observed, catalase activity increasing progressively with increase in germination percentage. Differences in catalase activity where the germination ranges were between 90 and 100% were very slight and it was difficult to predict anything from catalase activity with regard to germination for this range.—The authors conclude that seed showing no catalase activity have entirely lost their vitality. However, they call attention to the possibility of having catalase activity and no germination, this being particularly true in the case of impermeable seed.—J. P. Jones.

5859. NORTHROP, JOHN H. The kinetics of the decomposition of peroxide by catalase. Jour. Gen. Phys. 7: 373-387. Fig. 1. 1925.—In a study of the experiments of Morgulis upon

the decomposition of hydrogen peroxide by liver catalase at 20°C. an equation was found to fit the various mechanisms as follows: $K = \frac{1}{t} \log \frac{A}{A-x}$, in which x is the amount of O_2 liberated at the time t , A is the total amount of O_2 liberated (not the total amount available), and K is the inactivation constant of the enzyme.—O. L. Inman.

5860. PARFITT, E. H., AND GEORGE SPITZER. The quantitative action of enzymes of seven specific organisms upon the proteins of milk and upon gelatin. Jour. Bact. 9: 123-130. 1924. —The decomposition products produced by the action of the following organisms on milk and gelatin were quantitatively studied: *Bacillus mesentericus*, *B. mycoides*, *B. albolactis*, *B. ichthyosmius*, *Bacterium aerogenes*, *Streptococcus cremoris*, and *Bacterium prodigiosum*.—C. E. Skinner.

METABOLISM (RESPIRATION, AERATION)

5861. BLACKMAN, F. F. Oxygen and respiration. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 487. [1924.]

5862. CANNON, W. A. On the upper critical concentration of oxygen for root growth. Science 61: 118-120. 1925.—The upper critical concentration is defined as the partial pressure that will just permit a "normal" rate of growth at any given temperature. It may be fairly accurately determined experimentally. *Zea*, representing forms that need good aeration, has a range of from 4 to 10% for its upper critical concentration. The range for tolerant forms such as the orange and willow is less, but is so low that the upper critical concentration for high temperature may be the lower critical concentration for low temperature. Work correlating the known oxygen content of soils with the requirements for given species needs to be done to give the proper ecological applications.—C. J. Lyon.

5863. CROZIER, W. J. On biological oxidations as function of temperature. Jour. Gen. Phys. 7: 189-216. Fig. 1-15. 1924.—The critical thermal increments are calculated for respiratory processes (O_2 consumption, CO_2 production) in various plants and animals. They are characteristically found to be of 2, possibly 3 types: $\mu = 11,500$, and $\mu = 16,100$ or 16,700. The experimental results of several other authors were treated and fairly good agreement found. The chief object of further study of critical thermal increments is to attempt to identify controlling reactions in undisturbed living matter.—O. L. Inman.

5864. HUNTER, C., AND E. M. RICH. Observations on the effect of carbon-dioxide accumulation on root elongation. [Abstract.] Rept. British Assoc. Adv. Sci. 1923: 487. [1924.]

5865. KNIGHT, R. C. The response of plants in soil and water-culture to aeration of the roots. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 495. [1924.]

5866. LYON, CHARLES J. The effect of phosphates on respiration. Jour. Gen. Phys. 6: 299-306. 1924.—Phosphates increase the rate of both aerobic and anaerobic respiration. This acceleration almost disappears when the plant dies after 18-24 hours treatment with phosphate solution, but subsequently becomes greater than in life. The experiments were carried out quantitatively with *Elodea canadensis* and wheat seedlings.—Author.

ORGANISM AS A WHOLE

5867. ANDERVONT, H., AND CHARLES E. SIMON. On the origin of the so-called pellucid areas which develop on agar cultures of certain spore-bearing bacteria. Amer. Jour. Hygiene 4: 386-392. Pl. 3. 1924.—The origin of "pellucid areas" has been studied in some detail in *Bacillus cereus*.—The formation of these pits takes place only when vegetative forms of the organism have reached the surface of the surrounding sporangial growth, and is preceded by the development of elevated colonies, which are composed exclusively of these forms; these elevated colonies then become transformed into pits. The process of apparent lysis is not due to a principle which can be separated from the organisms in question by filtration or by washing and centrifugation. The potentiality of this type of lysis is inherent in the spore. The lytic effect becomes manifest in the presence of oxygen only. Exclusion of oxygen from an inoculated agar surface by means of petrolatum results in the development of vegetative forms in great abundance, without the subsequent formation of pits. During the process of lysis the cellular contents of the vegetative forms disappear, apparently with intervening

granule formation; at the same time granules appear in the free state. Filtrates of washed off cultures in which pit formation had taken place yielded a growth of the same organism after a week's incubation at 37°C., in 2 experiments out of 4. The type of "lysis" observed differs from that described by Twort and d'Herelle. Lysis is probably not a correct term to apply to the phenomenon under consideration, inasmuch as the process seems to end in granule formation, while the cell walls remain apparently intact.—*From Authors' summary.*

5868. HADLEY, PHILIP. The variation in size of lytic areas and its significance. Jour. Bact. 9: 397-403. 1924.—A strain of the d'Herelle bacteriophage active against the Shiga dysentery bacillus originally showed 2 types of lytic colonies—large and small, with no intergradations. The passage strain of the lytic principle, conducted in series through many cultures during the course of a year, showed at the end of this time only the small type of lytic colony. On the other hand, sealed tubes of the lytic agent, opened at the end of 1 year, and again after nearly 2 years, showed the large lytic colonies quite intact. Enumeration tests performed with lytic cultures of the "small" and the "large" lytic agents, respectively, showed that (a) the "small" lytic culture produced small areas only, while (b) the "large" lytic culture produced both small and large areas. These results are regarded as suggesting that the exciting cause of transmissible bacterial autolysis is susceptible of independent variation, quite apart from those variations in its behavior which are admittedly determined by differences in the resistance of the bacterial culture on which it acts.—*Author's summary.*

5869. HARRIS, J. A., W. F. HOFFMAN, AND A. H. JOHNSON. The reaction of the cotton plant. Science 61: 65. 1925.—The alkaline reaction reported in recent papers in Science (Ibid. 60: 268, 405. 1924) was found only in the dew from the leaf surfaces. The writers' measurements of the pH of the expressed tissue fluids indicated a concentration well on the acid side of neutrality. The values for Pima Egyptian cotton are pH 5.25-5.41, while Upland cotton gave values of pH 5.35-5.46.—*C. J. Lyon.*

5870. MATSUMOTO, TAKASHI. Further studies on physiology of *Rhizoctonia Solani* Kühn. Bull. Imp. Coll. Agric. For. Morioka 5: 1-64. 1 pl., 3 fig. 1923.—The present paper is to serve as a supplementary report by showing to what extent a single strain can exhibit specialization in physiological behavior under the influence of changes in the culture media or other environmental conditions, and at the same time by presenting some additional data concerning the physiological characteristics of the fungus in question. The penetration of cell wall as well as cuticle by *Rhizoctonia* might not be brought about by mechanical pressure alone, but at the same time might be assisted by enzymes or other related substances liberated from the invading hyphae. The effects of H-ion concentration on the growth of the strains and the activity of some enzymes were studied comparatively. Secretion of pectinase by the fungus was microscopically as well as chemically confirmed. Cultural experiments with special reference to the relationships between nitrogen and carbon requirements of the strains were performed to a certain extent. With few exceptions, the hyphal growth and enzyme activity may be more or less retarded by an addition of tannin, even at a relatively slight degree of concentration. The growing hyphae secrete a toxic substance which is injurious to the mycelial growth. Fusion of hyphae takes place more frequently between the hyphae from strains which have been isolated from the same species of host. Physiological characteristics of *Rhizoctonia* may be more or less modified by a transfer to host, or certain environment.—*Author. (Courtesy Japanese Jour. Bot.)*

5871. STUART, CHARLES A. The effect of environmental changes on the growth, morphology, physiology and immunological characteristics of *Bacterium typhosum*. Jour. Bact. 9: 581-602. 1924.—The power of growth of *Bacterium typhosum* is very different for different strains. Morphological variation seems to be determined by both the composition of the medium and the temperature at which the strains grow. The consistency of the growth is determined by the temperature alone. Considerable variation in the immunological properties of a strain can be shown, but only when the antigens are cultivated under extremely favorable or unfavorable conditions. All strains in all environments are remarkably constant in their physiological reactions. The variations shown by a single strain, in any characteristic other than consistency of growth, cannot be considered as indicative for the whole species. A variation, no matter how great, in any one character of a strain does not imply a variation

in all characters of that strain. From a previous environment a strain may gain a certain momentum which for a short time will determine the character of its reaction in any new environment.—*Author's summary.*

5872. WOLFERT, F. S. **Studies in the physiology of the fungi. XVII. The growth of certain wood-destroying fungi in relation to the H-ion concentration of the media.** *Ann. Missouri Bot. Gard.* 11: 43-97. *Fig. 1-18.* 1924.—Experiments were conducted with the following 8 fungi: *Polyporus adustus* (Willd.) Fr., *Polystictus versicolor* (L.) Fr., *Pleurotus ostreatus* Jacq., *Schizophyllum commune* Fr., *Pholiota adiposa* Fr., *Lenzites sepiaria* (Wulf.) Fr., *Armillaria mellea* (Vahl) Quel., and *Daedalea confragosa* (Bolt.) Fr. Growth curves for these fungi are given to illustrate the relation of growth to active acidity of the culture medium. A greater portion of the growth curves of all of these fungi is on the acid side and in the majority wholly on the acid side. The range of tolerance for acidity is given for each fungus when grown in Richard's and in peptone-nutrient solutions, and there is a discussion of the nutritional value of cellulose-nutrient solutions for these fungi when the source of C is the cellulose from filter paper, also white oak, pine, sugar maple, and poplar woods. Of all the solutions used, growth of all the fungi is best when peptone is used as the source of both N and C. This is especially true when sugar is used in addition. Organic N is more available for wood-destroying fungi than are the inorganic forms. Under environmental and physiological conditions differing from those recorded in this paper the results would be found to vary to some extent. "The pH limits, optimum pH zone, and direction of change in the active acidity of the substratum vary with the environmental conditions."—*S. M. Zeller.*

GROWTH, DEVELOPMENT, REPRODUCTION

5873. GREGORY, F. G. **The interrelation of light and temperature in growth and assimilation.** (Abstract.) *Rept. British Assoc. Adv. Sci.* 1923: 486. [1924].

5874. KEMPTON, J. H. **The rate of growth of green and albino maize seedlings.** *Jour. Agric. Res.* 29: 311-312. *Fig. 1.* 1924.—The rate of growth of green and albino maize seedlings was measured by a continuous recording device and compared with temperature and radiation curves. The 2 types of growth curves were found to be remarkably alike and the conclusion was drawn that in the early stages the lack of chlorophyll in the leaves has no effect on the time at which maximum elongation occurs.—*Author.*

5875. S., T. S. P. **Tissue growth.** [Rev. of: BEER, R. G. DE. *Growth.* viii + 120 p. 8 pl. E. Arnold & Co.: London, 1924.] *Nature* 114: 709-710. 1924.—It is considered that the author has done well in reducing our knowledge of a difficult subject to simple language.—The subject is discussed on the animal side.—*O. A. Stevens.*

5876. SHERMAN, JAMES M., AND WILLIAM R. ALBUS. **The function of lag in bacterial cultures.** *Jour. Bact.* 9: 303-305. 1924.—During the lag phase of a bacterial culture inoculated with old cells, 5% NaCl solution has no deleterious effect, but, just before and during the logarithmic phase, a similar concentration of the salt solution is very toxic. The authors suggest that the old cells assume the characteristics of young cells or undergo a biological rejuvenescence during the lag phase, which fits them for reproduction.—*C. E. Skinner.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

5877. PRANKERD, T. L. **The ontogeny of gravitational irritability in *Osmunda regalis*.** (Abstract.) *Rept. British Assoc. Adv. Sci.* 1923: 494. [1924].

5878. SCHWIEKER, FRIEDRICH. **Untersuchungen über die Postflorationsbewegungen einiger Geraniaceen.** [Post floral tropisms of Geraniaceae.] *Bot. Archiv.* 6: 206-230. *Fig. 1-6.* 1924.—The post floral movements of the Geraniaceae rest upon growth correlations. Cell elongation of the node produces a physiologically parallel process of growth acceleration at the apical end of the motor organ. This process is normally brought about through the vegetative influence of the growing pollen tube.—*William Seifriz.*

5879. TREITEL, OTTO. **Thermotropismus bei Wurzeln.** [Thermotropism of roots.] *Bot. Archiv.* 7: 375-388. *Fig. 1-6.* 1924.—Thermotropic curvature of roots of peas is produced only by direct heat and not by radiant heat. Roots left at 5°C. in sawdust show at first a weak negative, then a pronounced positive curvature when subjected for 10 minutes to a temperature of 20°C.—*William Seifriz.*

GERMINATION, RENEWAL OF ACTIVITY

5880. NIESER, OTTO. Beiträge zur Kenntnis der Keimungsphysiologie von *Anthoxanthum Puélii*, *Festuca ovina*, and *Aera flexuosa*. [Physiology of germination in *A. Puélii*, *F. ovina*, and *A. flexuosa*.] Bot. Archiv. 6: 275-312. 1924.—The 3 tested species show an increase in power of germination after 6-12 months. Young seed show poor power of germination. Germination in the dark produces lower values than in the light. High temperature (16-30°) is unfavorable for 2 of the species but favorable for *Festuca ovina*.—*William Seifriz*.

5881. OHGA, ICHIRO. Longevity of seed of *Nelumbo nucifera*. (Japanese.) Bot. Mag. Tôkyô 27: 87-95. 7 fig. 1923.—Seed of *Nelumbo nucifera* were found at some place in South Manchuria, buried in a peat layer, where, according to the author's opinion, they must have remained at least 120 years, or possibly 200 or even 400 years. Their water-content was found to be in the testa 11.96%, in the endosperm 11.43%, and in the embryo 9.93%. The seed were found to germinate after a few days, when one or both ends were filed.—*S. Ikeno*. (Courtesy Japanese Jour. Bot.)

REGENERATION

5882. JONES, W. NEILSON. Regeneration of roots and shoots in cuttings of seakale. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 486. [1924].

TEMPERATURE RELATIONS

5883. AYERS, S. HENRY, AND W. T. JOHNSON, JR. Studies on pasteurization. XI. The "majority" and "absolute" thermal death point of bacteria in relation to pasteurization. Jour. Bact. 9: 279-284. 1924.—The wide range between the majority and absolute thermal death point of a culture of *Bacterium aerogenes* is pointed out. The importance of the difference between these thermal death points is discussed in relation to large scale efficiency tests of pasteurizing processes. It is shown that positive results based on the survival of the test organisms are of value in efficiency tests, but no reliance can be placed on negative tests which show the absence of the test organism in the relatively limited amount of milk which can be conveniently examined.—*Authors' summary*.

5884. CUNLIFFE, PERCY W. The action of light on cotton. A summary of the literature. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 14: T 314-318. 1923.

5885. HOPKINS, E. F. Relation of low temperatures to respiration and carbohydrate changes in potato tubers. Bot. Gaz. 78: 311-325. 1924.—The investigation was undertaken to determine what are the physiological activities at temperatures below 10°C. Potatoes were used for the experiment, and precautions were taken to insure a complete absorption of CO₂. The results showed that up to a certain point respiration of potatoes increased as the temperature decreased. It was found further that sugar accumulation at 0°C. was slow at first, then increased rapidly, and finally decreased. At 4.5°C. the sugar content remained constant; at 1.17°C. the sugar content began to increase; at 0.83°C. the reducing sugars began to decrease, while the total sugar content showed an increase. It is probable that the acceleration of respiration at low temperatures depends on the concentration. A certain concentration of sugar may stimulate respiration, while another concentration probably inhibits respiration.—*L. J. Pessin*.

5886. ILLERT, HANS. Botanische Untersuchungen über Hitzetod und Stoffwechselgifte. [Death from heat and metabolic products.] Bot. Archiv. 7: 133-141. 1924.—The supra-maximal temperature constant of *Oxalis* is raised by insufficient nutrition and light, and lowered by poisons such as plasmolyzing substances.—*William Seifriz*.

5887. KOMURO, HIDEO. Studies in the effect of Röntgen rays upon the development of *Vicia faba*. Jour. Coll. Agric. Imp. Univ. Tôkyô 8: 253-292. 2 pl. 1923.—In the author's experiment on the effect of Röntgen rays published in 1921 he raised seed of "Sengoku-kurome" and "Hyôgo" races of *Vicia faba* and used a Giba gas tube (platinum anticathode). In 1922 he used seed of another kind of *Vicia faba* called "Wase-soramame," and X-ray tube, Ôkura gas tube with tungsten anticathode, using the water cell of aluminium to prevent the thermal factor from entering into the experiment, and was able to confirm the previous statements. One of these experiments is described in this paper. The most important new facts

gained from the author's experiments were as follows: Though the seed are exposed to Röntgen rays of high intensity, their development does not stop immediately, for they germinate and develop for a certain period. Sprouts from irradiated steeped seed containing much water do not appear above the soil, and the injured plants cease to develop at almost the same stage of growth under the ground. There is no difference in growth proportional to the doses given (when the steeped seed contain the same amount of water by steeping). When the dose of Röntgen rays exceeds a certain limit, it does not induce a visible difference in the state of impediment proportional to the dose. The effect of Röntgen rays in these cases is no more than an injurious stimulation for the seed; of course, this limit varies with the water content of the seed at the time of irradiation.—From these facts, the writer thinks it may be presumed that strongly irradiated seed are particularly affected at the plumule and radicle, and metabolic change of these parts may take place (the cytological changes in radicles resembling those of tumor cells), and when this change reaches a certain stage the seedlings cease to develop.—*Author. (Courtesy Japanese Jour. Bot.)*

5888. TAKAMINE, NOBORU. **On the effect of ultraviolet rays upon nuclear division of plants.** *Bot. Mag. Tôkyô* 37: 109–112. 1923.—The young root-tips of *Vicia Faba* and *Allium Cepa*, as well as pollen mother-cells of *Capsella* and *Lactuca* were exposed to ultraviolet rays during $\frac{1}{2}$ –3 hours. The following facts were observed: (1) The constrictions of each chromosome become more distinct than otherwise, and when the rays are very intense, they may be broken up at the constrictions. (2) Karyoplasmic masses are scattered irregularly. (3) Irregular distribution of chromosomes is observed, and sometimes tripolar divisions of somatic nuclei occur. (4) In the pollen formation some tetrad-cells do not develop into pollen grains, but degenerate. (5) Not only in the present experiments upon materials treated with ultraviolet rays, but also in the author's earlier experiments upon those not treated in this way, he has found that the number of karyoplasmic masses does not correspond to that of definite chromosomes, so that he cannot confirm Overton's view on the so-called prochromosomes.—*Author. (Courtesy Japanese Jour. Bot.)*

5889. TAKAMINE, NOBORU. **On the effect of ultraviolet rays upon nuclear divisions of plants.** (Japanese.) *Bot. Mag. Tôkyô* 37: (181)–(185). 1 pl. 1923. (See preceding entry.)

RADIANT ENERGY RELATIONS

5890. ANONYMOUS. **Effect of artificial light on the growth of plants.** *Nature* 114: 732–733. 1924.—Reference is made to the work of several investigators.—*O. A. Stevens.*

5891. HENDERSON, F. Y. **The direct effect of light on the rate of water-loss from the mesophyll of the leaf.** (Abstract.) *Rept. British Assoc. Adv. Sci.* 1923: 487. [1924].

5892. POLITZER, G., UND W. ALBERTI. **Über die Einwirkung des Ultravioletten Lichtes auf Tierisches Gewebe.** (Ausgeführt an der Hornhaut von Salamanderlarven.) [The effect of ultraviolet light upon animal tissues. (Carried out on the cornea of salamander larvae.)] *Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre* 1: 413–444. 20 fig. 1924.—Exposures of the corneal tissues of salamander larvae to ultraviolet rays caused destruction or injury of the epithelial cells. Those which survived were not able to resume normal cell divisions for some days after exposure. The development of melanophores in the corneal epithelium was stimulated, and their number increased by exposure to the rays. Strong pigmentation in the outermost epidermal layers prevented injury to the cornea.—*Ralph E. Cleland.*

5893. ROBBINS, W. J., AND W. E. MANEVAL. **Effect of light on growth of excised root tips under sterile conditions.** *Bot. Gaz.* 78: 424–432. 1924.—Root tips of corn were grown under sterile conditions in 50 cc. of Pfeffer's solution plus 2% glucose, and in the same solution with 80 or 400 parts per million of autolyzed yeast added. A single root tip was grown in each flask. Flasks containing the media with the root tips were exposed to diffuse north light, while other similar cultures were grown in total absence of light. It was found that diffuse light exerted a favorable effect on the continued growth of the root tips. In the tips exposed to light, anthocyanin developed, but none developed in the dark.—*L. J. Pessin.*

5894. SEMMENS, E. SIDNEY. **Polarized light and starch content of plants.** *Nature* 114: 719. 1924.—The author states that he has demonstrated an acceleration of hydrolysis by polarized light.—*O. A. Stevens.*

TOXIC AGENTS

5895. KRULL, CHRISTIAN. Untersuchungen über die Reaktionsempfindlichkeit von Keimlingen. [Reaction sensitivity of seedlings.] Bot. Archiv. 6: 334-404. Fig. 1-5. 1924.—At a concentration of 0.0019%, H_2SO_4 causes death of oat and rye seedlings. Both withstand concentrations of 0.00048% and under. Barley withstands 0.00004% of H_2SO_4 , is badly damaged by 0.00095%, and is killed by 0.00245%. Wheat is like oats and rye. The author lists 32 such experiments dealing with H_2SO_4 , HCl, NaOH, and NH_4OH .—*William Seifriz*.

5896. POLITZER, G. Versuche über den Einfluss des Neutralrots auf die Zellteilung. [The influence of neutral red upon cell division.] Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellen- u. Gewebelehre 1: 644-670. 21 fig. 1924.—The cornea of the eye of salamander larvae begins to show abnormal cell divisions (pseudoamitoses) 1 hour after a 2-hour subjection to 1:150,000 neutral red. In 6-10 hours, all mitoses have disappeared and do not reappear until after 2 or 3 days. Several types of pseudoamitosis are described. The injury is due to the toxic effect of the stain. The photodynamic effect heightens the toxic effect when animals are stained and kept in the light.—*Ralph E. Cleland*.

5897. SCHNEIDER, ALBERT. The paramedical method for determining the phenol coefficient of disinfectants. Jour. Amer. Pharm. Assoc. 13: 320-321. 1924.—In employing *Paramecium caudatum* as a test organism, a loopful of disinfectant solution to be tested for phenol coefficient is placed upon a slide to which is added a loopful of the paramedical culture, and the two are then thoroughly mixed. A phenol standard is prepared by making dilutions of a 1% solution of phenol, and the minimum killing dose (M. K. D.) is determined by employing various strengths of the phenol solutions on the *Paramecium* culture on the slide. The killing dilution of pure phenol was found to be 1:500.—*Anton Hogstad, Jr.*

5898. WOLKENHAUFR, WILHELM. Ueber den Einfluss von Reizstoffen auf das Längenwachstum der Wurzeln. [The effect of stimulating agents on the growth of roots.] Bot. Archiv. 6: 233-274. Fig. 1-7. 1924.—A 0.0005% solution of $CuSO_4$ stimulates growth of rye roots. Higher concentrations retard growth. Rubidium nitrate down to 0.0005% retards root growth. A 0.01% solution of the rubidium salt permitted growth equal to the control. Orange G solutions of 0.01, 0.1, 0.3, 0.5, and 1.0% strength stimulate the growth of roots of rye. Of these, 0.1% is the optimum. In 0.005, 0.05, and 2.0% solutions, growth is just as rapid as in tap water. All higher concentrations retard growth.—*William Seifriz*.

ELECTRICITY AND MECHANICAL AGENTS

5899. BLACKMAN, V. H., AND A. T. LEGG. The effect of electric currents on the growth of plants in pot cultures. (Abstract.) Rept. British Asso. Adv. Sci. 1923: 487. [1924.]

5900. BLACKMAN, V. H., A. T. LEGG, AND F. G. GREGORY. The effect of a direct electric current of very low intensity on the rate of the growth of the coleoptile of barley. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 487. [1924.]

MISCELLANEOUS

5901. DIXON, H. H. AND NIGEL G. BALL. The extraction of sap from living leaves by means of compressed air. (Abstract.) Rept. British Assoc. Adv. Sci. 1923: 486. [1924.]

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 5005, 5043, 5085, 5099, 5107, 5111, 5142, 5144, 5167, 5179, 5216, 5225, 5231, 5355, 5359, 5364, 5398, 5401, 5429, 5430, 5432, 5438, 5441, 5549, 5678, 5679, 5746)

GENERAL

5902. ANONYMOUS. [Rev. of: BAILEY, L. H. Manual of cultivated plants: a flora for the identifications of the most common or significant species of plants grown in the Continental United States and Canada for food, ornament, utility and general interest both in the open

and under glass. 851 p. The Macmillan Co.; New York & London, 1924 (see Bot. Absts. 13, Entry 5485).] *Nature* 114: 784. 1924.

5903. ANONYMOUS. [Rev. of: GAMBLE, J. S. *Flora of the Presidency of Madras*. Pt. 6. Scrophulariaceae to Plantaginaceae. vi + 963-1160 p. Adlard & Son and West Newman: London, 1924 (see Bot. Absts. 13, Entry 8065).] *Nature* 114: 821. 1924.

5904. COMPTON, R. H., AND OTHERS. A systematic account of the plants collected in New Caledonia and the Isle of Pines by Mr. R. H. Compton, M.A., in 1914.—Part II. Gymnosperms and Cryptogams. *Jour. Linn. Soc. Bot. London* 45: 421-466. Pl. 26-27. 1922.—The paper contains a systematic account of the gymnosperms, pteridophytes, and mosses collected in New Caledonia and the Isle of Pines by R. H. Compton in 1914.—Gymnosperms (by R. H. COMPTON). There are enumerated 29 species and varieties of which 4 are new, and 2 genera *Austrotaxus* and *Callitropsis* are new. The Gnetales and Ginkgoales are absent; the Cycadales represented by 1 species. The Coniferales are developed to an exceptional degree. There are 5 species of *Araucaria*, 3 of *Agathis*, 4 of *Dacrydium*, and 9 of *Podocarpus*. There are 27 native conifers and all are endemic. Their relationships are with New Zealand and eastern Australia. *Austrotaxus* is the most southerly representative of the Taxeae. The conifers belong to a number of different ecological types, and grow in a great variety of situations. They are most abundant in the montane forest above 3000 feet altitude, where they form essentially coniferous forest—"islands in an angiospermic sea." Only *Araucaria Cookii* R. Br. and *Callitris sulcata* Schlechter form the sole dominant species in a forest. The following species are described as new: *Podocarpus ferruginoides*; *Austrotaxus spicata*; and *Callitropsis araucarioides*. *Callitris sulcata* Schlechter var. *alpina* is also new. The new genera, *Austrotaxus* and *Callitropsis*, are illustrated.—Pteridophyta (by R. H. COMPTON). All main groups, except Isoetales, are represented, ferns and lycopods abundantly. The degree of endemism in this group is not high as compared with that of the gymnosperms and angiosperms. The general relationships of the pteridophytes are with the floras of eastern Australia and the Malayan region. There are listed 142 species of ferns in 44 genera and 25 species of other groups; the percentage of endemism is 39. The following species and varieties are described as new: *Cyathea albifrons* Vieill. var. *lata*; *C. neocaledonica*; *Lindsaya neocaledonica*; *L. Vieillardii* Mett. var. *serrata*; *Asplenium adiantoides* C. Chr. var. *tripinnata*; *A. polyphyleticum*; *Gymnogramme decipiens* Mett. var. *parva*; *Elaphoglossum ignambiense*; *E. neocaledonicum*; *Gleichenia Montaguei*; *Lycopodium ignambiense*; *L. mirabile* Willd. var. *microbracteata*; *L. phyllanthum* Hook. & Arn. var. *auriculatum*; *L. squarrosus* Forst. var. *pacificum*. The following forms are new: *Hymenophyllum muioides* Baker f. *amplior*; *Lomaria attenuata* Willd. f. *monstrosa*; *L. Lenormandi* Baker f. *aprica*; *Pteris Vieillardii* Mett. f. *furcata*; *Marattia Smithii* Mett. f. *soluta*; and *Lycopodium nutans* Brack. f. *nana*.—Musci (by I. THERIOT). Twenty-five species and varieties are listed.—A. J. Eames.

5905. F[ERNALD], M. L. A flora of Springfield, Massachusetts. [Rev. of: ANDREWS, LUMAN. Catalogue of the flowering plants and ferns of Springfield, Massachusetts. Bull. Mus. Nat. Hist. [Springfield, Massachusetts] 3. 1-221. 10 pl. 1924 (see Bot. Absts. 14, Entry 3026).] *Rhodora* 26: 179, 180. 1924.

5906. KUBART, B. Einige Bermurkungen über den diagnostischen Wert des Markkörpers bei Koniferenholzern. [Some observations on the diagnostic value of the pith-bodies in the woods of conifers.] *Ber. Deutsch. Bot. Ges.* 42: 273-276. 1924.—The study of the pith-bodies is valuable in connecting the fossil forms with the present day conifers.—Hally Jolivette Sax.

5907. RAEDER, FRITZ. Sero-diagnostische Untersuchungen über strittige Verwandtschaftsverhältnisse innerhalb der Dykotylen. [Sero-diagnostic investigations of the dicotyledons.] *Bot. Archiv.* 7: 9-40. 4 fig. 1924.—The author gives extensive tables of the serum reactions (conglutination) of many dicotyledons, from which he traces phylogenetic relationships.—William Seifriz.

5908. SPIEKERKOETTER, HEINZ. Untersuchungen zur Anatomie und Systematik ostafrikanischer Meliaceen, Burseraceen und Simarubaceen. [Anatomy and taxonomy of East African Meliaceae, Burseraceae and Simarubaceae.] *Bot. Archiv.* 7: 274-320. Fig. 1-28. 1924.—Only in the Burseraceae are there striking anatomical characteristics. The secre-

tion cells of the Meliaceae are not specific as character determinators since they do not always occur and may occur in the Simarubaceae. This latter family is the least unified, since neither idioblasts nor secretion cells nor resin canals are universally present.—*William Seifriz*.

5909. SPRAGUE, T. A. Principles of nomenclature. Gard. Chron. III. 75: 92-93, 104. 1924.—The author calls attention to the lack of method followed by many botanists in segregating genera, commonly referred to as the method of residues, and points out the desirability of maintaining as type one of the species within the original genus except where it would involve the change in the generic name of a large and well known genus.—*P. L. Ricker*.

PTERIDOPHYTES

5910. FERNALD, M. L. *Polystichum mohrioides* and some other subantarctic or Andean plants in the northern hemisphere. *Rhodora* 26: 89-95. 1924.—The author regards *Polystichum mohrioides* (Bory) Presl as an inclusive species of subantarctic dispersal, with var. *plicatum* (Poepig) Christensen (*P. andinum* Phil.) on the southern Andes, var. *elegans* (Remy) Christensen on the central and northern Andes, var. *scopulinum* (D. C. Eaton) n. comb. (*P. scopulinum* Maxon) in western North America and in Gaspé County, Quebec, and var. *Lemmoni* (Underw.) n. comb. (*P. Lemmoni* Underw.) in western North America. The range of the aggregate-species, *P. mohrioides*, is in general similar to ranges of some other plants: *Myriophyllum elatinoides* Gaudich., the red-berried species of *Empetrum*, and the genus *Lilaeopsis*, which are discussed in detail. *Lilaeopsis attenuata* (Hook. & Arn.) n. comb., is published.—*Author*.

SPERMATOPHYTES

5911. BECKER, WILH. Eine neue Euphrasia aus Transkaukasien. [A new Euphrasia from Transcaucasia.] Repert. Spec. Nov. Regni Veg. 17: 42. 1921. (Repert. Eur. et Med. 1: 426. 1921).—A Latin description is given of *Euphrasia coronata* n. sp. from Lasistan, east of Batum.—*John E. Dinsmore*.

5912. BENOIST, R. Descriptions d'espèces nouvelles d'Acanthacées d'Indo-Chine. [New Acanthaceae from Indo-China.] Bull. Mus. Hist. Nat. [Paris] 27: 543-547. 1921.—The following new species are described: *Thunbergia Eberhardti* from Tongking; *Strobilanthes hypomallus* from Annam; *S. brunnescens* and *S. sarmentosa* from Tongking; *S. polystachyus* from Laos; and *S. Poilanei*, *S. dolichophylla* and *S. comosa* from Cambodia.—*John M. Fogg, Jr.*

5913. BLACK, J. M. Additions to the flora of South Australia. No. 20. Trans. and Proc. Roy. Soc. South Australia 46: 565-571. Pl. 37. 1922.—The following new species and varieties are described: *Stipa setacea* R. Br. var. *latiglumis*, *S. eremophila* Reader var. *dodrantaria*, *S. pubescens* R. Br. var. *comosa*, *Eriachne ovata* Nees var. *pedicellata*, *Cyperus exaltatus* Retz. var. *minor*, *Scheonus tesquorum*, *Moraea xerospatha* MacOwan var. *monophylla*, *Chenopodium carinatum* R. Br. var. *melanocarpum*, *C. microphyllum* F. v. M. var. *desertorum*, *Bassia ventricosa*, *B. limbata*, *B. decurrens*, *B. paradoxa* (R. Br.) F. v. M. var. *latifolia*, *Atriplex leptocarpus* F. v. M. var. *acuminatum*, *Babbagia acroptera* F. v. M. & Tate var. *deminuta*, *Kochia scleroptera*, *Uldinia* n. gen. of the Umbelliferae, tribe *Hydrocotyleae*, *U. mercurialis*, and *Eremophila pentaptera*.—*Wm. Randolph Taylor*.

5914. BLAKE, S. F. New American Meibomias. Bot. Gaz. 78: 271-288. Pl. 4. 1924.—The following new species are described with accompanying notes: *Meibomia pycnantha*, *M. sylvestris*, *M. tephrophylla*, *M. rhynchodesma*, *M. crotalum*, *M. psilacra*, *M. bella*, *M. leptomeris*, *M. tenuipes*, *M. cryptopoda*, *M. urarioides*, and *M. dasycara*. The new combinations are: *Meibomia ciliaris* (Muhl.), *M. cana* (Gmel.), *M. acuminata* (Michx.), *M. infructa* (DC.), *M. subsessilis* (Schlecht.), and *M. Micheli* (*Desmodium madrense* Micheli, not Hemsl.).—*B. W. Wells*.

5915. BLAKE, S. F. Notes on American Lespedezas. *Rhodora* 26: 25-34. 1924.—The article opens with a brief general review of the various treatments of the American species of *Lespedeza* by Torrey and Gray, Maximowicz, Gray, Britton, Mackenzie and Bush, and Shindler. *L. procumbens* var. *elliptica*, n. var. from the southeastern states is described;

L. violacea var. *prairea* Mackenzie & Bush, which has been raised to specific rank as *L. prairea* Britton, is found to have no satisfactory characters to separate it from *L. violacea*. *L. Stuevei* Nutt., the name of which is usually spelled *L. Stuevi*, should be written as originally spelled. *L. Stuevi* var. *angustifolia* Britton is problematical and may be a hybrid of *L. Stuevei* and *L. virginica*. *L. frutescens* (L.) Britton nomenclatorially rests upon *Hedysarum frutescens* L. (said to be *L. violacea*) and this name, therefore, cannot be used for the plant currently known as *L. frutescens*. The name to be used is *L. intermedia* (Wats.) Britton, and a new variety, *L. intermedia* var. *Hahnii* is described. Attention is called to Schindler's discovery, that in *L. hirta*, *L. capitata* and *L. angustifolia* cleistagamous flowers occur among the showy ones, while in *L. leptostachya* the flowers are normally cleistogamous. *L. hirta* var. *appressipilis* n. var. is described from Florida.—*M. L. Fernald*.

5916. BLAKE, S. F. The name of the spearmint. *Rhodora* 26: 171-175. 1924.—Farwell has sought to show that the name *Mentha spicata* L. belongs to the horse mint of Europe, usually called *M. longifolia*, and that the spearmint should be called *M. viridis*. The author studies the sources of the names used by Linnaeus and reaches the conclusion that the 3 mints described by him in the 1st edition of *Species Plantarum* are to be designated as follows: *M. spicata* L. (*M. spicata* α *viridis* L., *M. viridis* L.); *M. longifolia* Huds. (*M. spicata* β *longifolia* L., *M. sylvestris* L.); and *M. rotundifolia* Huds. (*M. spicata* γ *rotundifolia* L.).—*M. L. Fernald*.

5917. BORNMÜLLER, J. Über eine neue Carum-Art aus dem Balkan. [A new species of Carum from the Balkans.] *Oesterreich. Bot. Zeitschr.* 70: 101-102. 1921.—*Carum scaligeriodes* is described as a new species, based on material from central Macedonia and from the island of Thasos. It belongs to the section *Eucarum* and is closely related to *Carum multiflorum* (S. Sm.) Boiss.—*T. D. Howe*.

5918. BORNMÜLLER, J. Über zwei neue Nelken aus dem Balkan. [Two new pinks from the Balkans.] *Repert. Spec. Nov. Regni Veg.* 17: 38-41. 1921. (*Repert. Eur. et Med.* 1: 422-425. 1921.)—Full diagnoses are given of these species: *Silene viscariopsis* n. sp. from Central Macedonia near Prilep, and *Dianthus Sündermanii* n. sp. originally from Greece.—*John E. Dinsmore*.

5919. BORNMÜLLER, J. Zur Nomenklatur der Schivereckia Bornmülleri Prantl. [The nomenclature of Schivereckia Bornmülleri Prantl.] *Repert. Spec. Nov. Regni Veg.* 17: 34-36. 1921. (*Repert. Eur. et Med.* 1: 418-420. 1921.)—The original name, *S. Podolica* Boiss. having passed through several changes is now to be *S. Dörfleri* (*Draba Dörfleri* Wettst.).—*John E. Dinsmore*.

5920. BORNMÜLLER, [J.], ET [H.] WOLFF. Pimpinella cruciata spec. nov. *Repert. Spec. Nov. Regni Veg.* 17: 44. 1921. (*Repert. Eur. et Med.* 1: 428. 1921.)—A description in Latin is given of this new species from Amasia in Pontus. Two plants from Armenia were originally described under one name: *P. cervariacifolia* by Freyn & Sint. These are here separated into *P. anthriscoides* Boiss. and *P. cruciata* Bornm. & Wolff.—*John E. Dinsmore*.

5921. BRETZLER, EMMA. Beiträge zur Kenntnis der Gattung Platanus. [The genus Platanus.] *Bot. Archiv.* 7: 388-417. Fig. 1-43. 1924.—The family Plantanaceae stands between the Rosaceae and the Hamamelidaceae, and consists of the 1 monotypic genus *Platanus*. *P. acerifolia*, *P. occidentalis*, and *P. orientalis* are but forms of a species which cannot be clearly distinguished. They show no difference in cork formation, in foliation, in flowers, and in seed and fruit. There are masculine and feminine flowers. The latter all have staminodes which occasionally carry ripe pollen.—*William Seifriz*.

5922. CAMUS, A. Espèces et variété nouvelles de Graminées asiatiques. [New Asiatic Gramineae.] *Bull. Mus. Hist. Nat. [Paris]* 27: 455, 456. 1921.—The author describes the following new species and variety from French Indo-China: *Oxytenanthera Poilanei* and *Digitaria quinhonensis* from Annam; *Garnotia Poilanei* from Cambodia; and *Oryza latifolia* var. *silvatica* from Cochin China.—*John M. Fogg, Jr.*

5923. CAMUS, A. Un Spodiopogon nouveau d'Asie. [A new Spodiopogon from Asia.] *Bull. Mus. Hist. Nat. [Paris]* 27: 551. 1921.—A new species of grass from China, namely *Spodiopogon Duclouxii*, is described.—*John M. Fogg, Jr.*

5924. CHERMEZON, H. Sur quelques Cypéracées nouvelles du centre de Madagascar.

[Some new Cyperaceae from Madagascar.] Bull. Mus. Hist. Nat. [Paris] 27: 552-554. 1921.—The author describes the following new species and varieties from central Madagascar: *Mariscus andringitrensis*, *Pycnus reductus*, *Cyperus nemoralis*, *C. micrantherus*, *C. debilis-simus* Baker var. *triquetus*, and *C. stramineicolor* H. Cherm. var. *betsileensis*.—John M. Fogg, Jr.

5925. CHEVALIER, A., ET A. CAMUS. Deux Bambous nouveaux de l'Annam. [Two new bamboos from Annam. (French Indo-China.)] Bull. Mus. Hist. Nat. [Paris] 27: 450-454. Fig. 1-17. 1921.—This article contains critical descriptions of and distributional notes on *Arundinaria pusilla* and *Cephalostachyum langbianense*, n. spp.—John M. Fogg, Jr.

5926. COVILLE, FREDERICK V. *Grossularia echinella*, a spiny-fruited gooseberry from Florida. Jour. Agric. Res. 28: 71-74. 1 pl. 1924.—More than a million dollars has been spent in the eradication of gooseberries and currants in the white pine region of the northern U. S. A. because these plants are the carriers of a blister rust which threatens the destruction of the white pine forests. A new species of gooseberry, *Grossularia echinella* Coville, has been discovered in Florida, which because of its almost subtropical habitat and the large size of its berries in the wild state (ripe berries reaching a diameter of $\frac{3}{8}$ of an inch) may be of value as a plant with which to hybridize the best varieties of cultivated gooseberries in order to produce new and valuable varieties adapted to much warmer climates. If satisfactory hybrids can be produced it may be possible ultimately to extend gooseberry culture in the U. S. A. southward beyond the range of white pine and white pine blister rust.—Author.

5927. DIELS, L. Drei neue chinesische Iris-arten. [Three new Chinese species of Iris.] Svensk Bot. Tidskr. 18: 427-429. 1924.—*Iris proantha*, *I. polysticta*, and *I. narcissiflora* are described as new.—O. Heilborn.

5928. ELFSTRAND, M. Über einige hochalpine Piloselloiden-Hieracien aus der hohen Tatra. [Some alpine Hieracia-Piloselloidea from Tatra.] Svensk Bot. Tidskr. 18: 542-547. 1924.—A detailed description of *H. Ullepitschii* Blocki is given and *H. quasadnatum*, *H. depennatum*, and *H. rufotectum* are described as new.—O. Heilborn.

5929. FARWELL, OLIVER A. The correct name for the spearmint. Rhodora 26: 19-22. 1924.—A discussion of the history of the names is given, and the conclusion reached that *M. spicata* L. is the correct name for the plant with tomentose leaves, which has been known as *M. longifolia* (L.) Hudson and *M. sylvestris* L.; while *M. viridis* (L.) L. is the correct name for the spearmint, this being the *M. spicata* of Hudson and of recent American authors, not L.—M. L. Fernald.

5930. FASSETT, NORMAN C. A new variety of *Bidens heterodoxa*. Rhodora 26: 177-178. 1924.—*Bidens heterodoxa* (Fernald) Fernald & St. John var. *interstes* is described as a new variety from high-tide level along the Kenebec River, Maine.—M. L. Fernald.

5931. FASSETT, NORMAN C. A study of the genus *Zizania*. Rhodora 26: 153-160. 1924.—The author finds a distinct difference in the texture of the pistillate lemmas and upon these and other characters concludes that *Zizania aquatica* L. was the coarse plant treated by Hitchcock as *Z. palustris*, while *Z. palustris* L. is the more slender northern plant treated by Hitchcock as *Z. aquatica*. Two species are recognized: the Asiatic *Z. latifolia* Turcz. and the American *Z. aquatica*, the latter with var. *brevis* n. var. from the St. Lawrence River near Quebec, var. *angustifolia* Hitchcock (*Z. palustris* L.) and var. *interior* n. var. from Lake Michigan to Nebraska and Texas. Among species excluded from *Zizania* is *Z. terrestris* L. which becomes *Scleria terrestris* (L.) n. comb. (= *S. elata* Thwaits).—M. L. Fernald.

5932. FEDTCHENKO, BORIS. Clethraceae de l'Amérique du sud. [South American Clethraceae.] Svensk Bot. Tidskr. 18: 487-491. 1924.—The work contains a list of South American species of *Clethra* with some critical remarks and indications of geographical distribution. *C. Bridgesii* from Bolivia is described as new.—O. Heilborn.

5933. FERNALD, M. L. *Myriophyllum magdalenense*; a correction. Rhodora 26: 198. 1924.—The specific name was misspelled through orthographic error in the original publication. It should be as given above.—Author.

5934. FERNALD, M. L. New or recently recognized plants of eastern America. Rhodora 26: 122-126. 1924.—The plant known as *Fatsia horrida* (Sm.) B. & H. or as *Echinipanax horridum* (Sm.) Dec. & Planch. should be called *Oplopanax horridum* (Sm.) Miquel., the plant

being generically distinct from *Fatsia* and the name *Oplopanax* the first properly published generic name. The genus long called *Troximon* Nutt. should be known as *Agoseris* Raf. Nuttall defined no genus *Troximon* as distinct from *Troximon* Gaertn. (1791), the latter being *Cynthia* D. Don (1829). The following new names are published: *Carex Hostiana* var. *laurentiana* (Fernald & Wiegand) Fernald & Wiegand n. comb., *Salix Bebbiana* vars. *luxurians* (Fernald) and *capreifolia* (Fernald), *S. hebecarpa* (Fernald), *Hackelia deflexa* var. *americana* (Gray) Fernald & Johnston, and *Agoseris gaspensis* n. sp. notable as the 1st member found in the Shickshock Mountains of this prevailingly Cordilleran genus.—*Author*.

5935. FERNALD, M. L. Some *Senecios* of eastern Quebec and Newfoundland. *Rhodora* 26: 113-122. Pl. 108. 1924.—*Senecio resedifolius* Less., long known from the Bering Sea region and from the Altai and other remote areas in Siberia is found on the Mount Logan range of Matane County, Quebec, where it presents essentially all the variations described from Asia and from northwestern America. *S. Fernaldii* Greenm. of western Newfoundland proves to be an extreme variation of *S. resedifolius*. *S. pauciflorus* Pursh and *S. indecorus* Greene prove to be thoroughly distinct species, with heretofore unnoted characters of the corollas, achenes and receptacles, *S. pauciflorus* (including *S. discoideus* Hook. and *S. Lambertii* Greene) occurring from northern Labrador to the mountains of Matane County, Quebec, and from arctic northwestern America to Wyoming and California; *S. indecorus* (*S. discoideus* of most authors, not Hook., *S. idahoensis* Rydb., *S. Burkei* Greenm.) from Gaspé Co., Quebec, to the Lake Superior region, and from British Columbia to Idaho and northern California.—*Author*.

5936. GAGNEPAIN, F. Un genre nouveau de Moracées. [A new genus of the Moraceae.] Bull. Mus. Hist. Nat. [Paris] 27: 441-443. Fig. 1-14. 1921.—*Dimerocarpus Brenieri* n. gen. and n. sp., collected at Tongking, French Indo-China and grown in the greenhouses of the National Museum at Paris are described and illustrated. The new genus is placed in the subtribe *Eumoreae* of the Moraceae.—*John M. Fogg, Jr.*

5937. GEITH, KARL. Experimentell-systematische Untersuchungen an der Gattung *Epilobium* L. [Experimental taxonomic investigations of the genus *Epilobium*.] Bot. Archiv. 6: 123-186. Fig. 1-178. 1924.—Spontaneously formed hybrids of *Epilobium* are often met with. Extensive crosses of numerous *Epilobium* species were made. The many hybrids are fully described and compared with the parents.—*William Seifriz*.

5938. GINZBERGER, AUGUST. Über einige *Centaurea*-Arten der adriatischen Küsten und Inseln. II. Zur Kenntnis der Systematik und geographischen Verbreitung des Formenkreises von *Centaurea Friderici* Vis. und *Centaurea crithmifolia* Vis. [Some species of *Centaurea* of the Adriatic coasts and islands. II. The classification and geographical distribution of the group of forms represented by *Centaurea Friderici* Vis. and *Centaurea crithmifolia* Vis.] Oesterreich. Bot. Zeitschr. 70: 114-140. Fig. 7. 1920.—This is a continuation of a study of the group of species found on the islands of Pomo and Pelagosa piccola. In cultivation at Vienna the plants are much less xerophytic in structure than when found in nature. The 3 forms growing on Pomo are more like each other than they are like *C. Friderici* on Pelagosa. A hypothetical ancestral form of all of them is pictured and the possible methods of its migration to the islands is discussed. The conclusion is that the fruits were probably carried by ocean currents since they will float on water for as long as 24 days, while they cannot be carried by the wind to any great distance. This ancestral form was probably related to *C. cineraria* or a similar species.—*T. D. Howe*.

5939. GODFERY, M. J. The fertilization of *Cephalanthera*, Rich. Jour. Linn. Soc. Bot. London 45: 511-516. 1922.—Pollination in *Cephalanthera* is apparently brought about by the adherence of the pollinia to an insect which has become coated with the viscid secretion of the stigma. The rostellum is lacking, and hence the dry pollinia can not be removed in the usual way. *C. ensifolia* and *C. rubra* are apparently cross-pollinated, but *C. grandiflora* is largely self-pollinated, the pollinia resting directly upon the upper edge of the stigma. The author believes the genus an ancient one, representing in its lack of pollen tetrads and restellum the primitive orchid type of pollination. The genus should be held distinct from *Epipactis*; it is not degraded from the latter, as Darwin believed, but represents the ancestral form of this genus.—*A. J. Eames*.

5940. GROSS, L. *Viola pumila* Chaix $\times$ *silvestris* (Lmk. p.p.) Rchb. hybr. nov. = *V. Gerstlaueri* L. Gross. Repert. Spec. Nov. Regni Veg. 17: 37-38. 1921. (Repert. Eur. et Med. 1: 421-422. 1921.)—This new hybrid is from near Mechtersheim, Speyer and Otterstadt Palatinate. By the same author (*Ibid.* p. 38 (422)) 2 other violets are described: *Viola Riviniana* Rchb. var. *trichocarpa* n. var. in herb. L. Gross from the Palatinate, and *V. silvestris* (Lmk. p. p.) Rchb. var. *trichocarpa* n. var. from Brückenau in Bavaria.—John E. Dinsmore.

5941. HAYEK, AUGUST. *Zwei neue Tragopogon*—Arten. [Two new species of *Tragopogon*.] Repert. Spec. Nov. Regni Veg. 17: 36-37. 1921. (Repert. Eur. et Med. 1: 420-421. 1921.)—Two new species of *Tragopogon* are described in Latin: *Tragopogon Stribrnyi* from Papakli in Bulgaria; and *T. transsilvanica* from Transylvania, near Klausenburg, and from Central Macedonia, near Allehar.—John E. Dinsmore.

5942. HOWARTH, W. O. On the occurrence and distribution of *Festuca rubra* Hack. in Great Britain. Jour. Linn. Soc. Bot. London 46: 313-331. Pl. 26-30. 1924.—The author has studied *Festuca rubra* in the broad sense, taking the classification of Hackel as a basis. Characters were found in basal branching, apices and sclerenchyma of the leaves, and in the ovaries. Three species are distinguished, also many subspecies and varieties. It is impossible to determine from the text whether any varietal names represent new combinations. The relationship of the forms studied is discussed. *F. duriuscula* L. is determined to belong to the "rubra" complex rather than to *F. ovina*. A bibliography is appended.—K. M. Wiegand.

5943. HU, H. H. Notes on Chinese ligneous plants. Jour. Arnold Arboretum 5: 227-233. 1924.—The author describes a number of new species, proposes new combinations, and gives full descriptions of *Pterospermum Levinei* Merr. and *Brandisia discolor* Hook. f. The following names are new: *Vaniera tricuspidata* (Carr.), *Polychroa scabra* (Benth.), *Magnolia Fordiana* (Oliv.), *Spatholobus parviflorus* (Roxb.), *Aspidopteris orbiculata* (Roxb.), *Fagara mengtzeana*, *Walsura trijuga* Kurz var. *microcarpa* (Pierre), *Tapirira hirsuta* (Roxb.), *Stemonurus hainanensis* (Merr.), *Elaeocarpus kwangtungensis*, *E. yentangensis*, *Sloanea sinensis* (Hance), *Eriolaena szemaonensis*, *E. glabrescens*, *Syzygium gracilentum* (Hance), *Gilibertia acuminatissima* (Merr.), *Maesa Henryi*, *Tylophora Dielsii* (Lév.), and *Tricalysia mollissima* (Hutch.).—Alfred Rehder.

5944. KOIDZUMI, GEN'ITI. A preliminary report on the garden forms of *Morus bombycis* Koidz. (Japanese) Rept. Imp. Seric. Exp. Sta. Japan. 6. 14 pl., 40 fig. 1922.—The author has investigated the numerous garden varieties or forms of *Morus bombycis* Koidz. as represented in the gardens of Japan. The taxonomic results are given for the 42 recognized forms.—Author. (Courtesy Japanese Jour. Bot.)

5945. КОЗО-ПОЛЯНСКИЙ, Б. М. [KOZO-POLJANSKI, B. M.] Note sur le genre *Platylophium* Turcz. [Note on the genus *Platylophium* Turcz.] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. Republique Russe] 20: 1-2. 1921.—The author calls attention to the generic name *Platylophium* Turcz. which apparently has been generally overlooked in bibliographical literature.—C. W. Dodge.

5946. KRAENZLIN, [F. M. L.] *Lothiania* nov. gen. Gard. Chron. III. 75: 173. Fig. 70. 1924.—*Lothiania* is proposed as a new genus of the Orchidaceae. One species, *L. mordax* (*Masdevallia mordax* Reichb. f.), from Colombia, South America, is described and illustrated.—P. L. Ricker.

5947. KUDŌ, YŪSHUN. A contribution to our knowledge of the flora of northern Saghalien. Jour. Coll. Agric., Hokkaido Imp. Univ. Sapporo 12: 1-68. 12 pl. 1923.—The article contains results of the study of plants of northern Saghalien, engaged in by the writer in the summer of 1922. A description of the trip is given with special reference to the vegetation of the district. Types of vegetation are recorded and illustrated. A list is presented of 402 species distributed among 211 genera and 67 families. Locality and habitat are given for each species. The following new names and combinations are proposed: *Polygonum frigidum*, *Polygonum polymorphum* Ledeb. var. *ajanense* Rgl. & Til. f. *divaricatum*, *Cerastium caespitosum* Gilib. var. *glandulosum*, *Pulsatilla Tatewakii*, *Sedum pluricaule*, *Sorbus commixta* Hedl. var. *Takasui*, *Inula britannica* L. var. *tymiensis*, *Artemisia sacrorum* Ledeb.

var. *angustiloba*, *Crepis Tatewakii*, and *Scorzonera radiata* Fisch. var. *humilis* Miyabe & Kudo.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5948. LACAITA, C. C. The *Onosmas* of Linnaeus and Sibthorp, with a note on those of Tournefort's herbarium. *Jour. Linn. Soc. Bot. London* 46: 387-400. Pl. 38. 1924.—The gender of the name *Onosma* is discussed, and the neuter gender is preferred. Of the 3 species of Tournefort's "Institutiones" 2 are represented by specimens in his herbarium. One is *O. echioides* α L., the other *O. echioides* β L. Of the 2 *Symphytums* of the *Onosma* group in Tournefort's "Corollarium," one is *O. graecum* Boiss. the other is *O. cinereum* Schreb. (*O. albo-roseum* Fisch. & Mey.). The 2nd edition of Linnaeus' *Species Plantarum* and Linnaeus' herbarium furnish 4 species of *Onosma*; *O. tinctorium*, *O. simplicissimum*, *O. orientale*, and *O. echioides*. The latter, which furnishes a very difficult problem in nomenclature, is discussed in detail. The 5 species mentioned in Sibthorp's "Prodromus" are discussed in detail, and some pencil notes of Sibthorp are reproduced.—*K. M. Wiegand.*

5949. LECOMTE, H. Une Juglandacée du genre *Carya* en Indochine. [The genus *Carya* in Indo-China.] *Bull. Mus. Hist. Nat. [Paris]* 27: 437-440. Fig. 1-10. 1921.—The author describes and figures *Carya tonkinensis*, n. sp. from Tongking, French Indo-China. The description is followed by a discussion of the nut (locally known as "May chau") and of the character of the wood of this tree.—*John M. Fogg, Jr.*

5950. MEZ, CARL. *Additamenta monographica* 1924. *Bot. Archiv.* 6: 230-232. 1924.—The following new species are described: *Silvia Rondonii* Mez & Hoehne, Brazil; *Maesa echinotricha* Mez, *M. Pullei* Mez, *M. Lorentziana* Mez, *Rapanea cacuminum* Mez, and *R. gomphostigma* Mez, New Guinea.—*William Seifriz.*

5951. NAKAI, TAKENOSHIN. *Notulae and Plantas Japoniae et Koreae XXVIII.* [Notes on plants of Japan and Corea.] *Bot. Mag. Tôkyô* 36: 117-128. 1922.—In this article the author has described the following new plants: *Allium yesoense*, Yeso; *Polygonum neo-filiforme*, Hondo and Corea; *Machilus Thunbergii* var. *obovata*, Corea; *Astilbe glaberrima*, Isl. Yakushima; *Astilbe formosa*, Hondo; *Astilbe congesta*, Hondo and Yeso; *Boninia glabra* var. *crassifolia*, Bonin; *Meliosma hachijoensis*, Isl. Hachijyo; *Adenophora moiwana*, Yeso; *Carex tenuistachya*, Hondo; *Peperomia pacifica*, Sulphur Island. The following plants are to be added to the Korean Flora: *Nuphar pumilum*, *Pyrus Uematsuana*, *Daphne Genkwa*, *Wikstroemia trichotoma*, and *Senecio pseudo-Arnica*.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5952. NAKAI, TAKENOSHIN. *Notulae ad Plantas Japoniae et Koreae XXX.* [Notes on plants of Japan and Corea.] *Bot. Mag. Tôkyô* 37: 69-82. 1923.—This contains the following new species and varieties: *Asparagus verrucosus*, Corea; *Chaenomeles eugenoides* var. *tortuosa*, Patria ignota; *Lepedeza bicolor* var. *velutina*, Hondo; *L. homoloba*, Japan; *L. intermedia*, Corea and Quelpaert; *L. intermedia* var. *alba*, Corea; *L. intermedia* var. *angustifolia*, Corea and Quelpaert; *L. maritima*, Corea; *L. melanantha*, Corea; *L. patens*, Hondo; *Euonymus alatus* var. *latifolia*, Corea; *Eurya minima*, Patria ignota; *Plectranthus lanceus*, Kiusiu. The change of scientific names is as follows: *Cydonia japonica* var. *eburnea* to *Chaenomeles angustifolia* var. *eburnea*; *Cydonia Manlei* alba to *Chaenomeles angustifolia* var. *alba*; *Pyrus japonica* alba to *Chaenomeles eugenoides* var. *alba*; *Cydonia Manlei* var. *superba* to *Chaenomeles eugenoides* var. *superba*; and *Lepedeza Sieboldii* to *Lepedeza penduliflora*.—Under *Chaenomeles angustifolia* the author has especially discussed the species of *Chaenomeles* and given a key for 4 known species of this genus. Besides, the following 2 species are added to the respective floras, namely, *Moricandia sonchifolia* to Corea, and *Artemisia borealis* var. *Wormskjoldii* to Hondo.—*Author.* (*Courtesy Japanese Jour. Bot.*)

5953. PELLEGRIN, F. *Plantae Letestuanæ novæ ou Plantes nouvelles récoltées par M. Le Testu de 1907 à 1919 dans le Mayombe congolais.* [New plants collected by Le Testu in Mayomba. III.] *Bull. Mus. Hist. Nat. [Paris]* 27: 444-449. 1921.—The following species from French Equatorial Africa are described as new: *Scaphopetalum ngouniense*, *Cola LeTestui*, *Bombax Chevalieri*, *Citropsis LeTestui*, *Pachylobus LeTestui*, *P. heterotricha*, and *Guarea mayombensis*.—*John M. Fogg, Jr.*

5954. PRIEGO, J. MANUEL. *La biología del olivo.* [The biology of the olive.] *Bol. Agric. Tec. y. Econ. [Spain]* 15: 655-665. 9 fig. 1924.—De Candolle places 29 species in the genus *Olea*, recognizing 2 sections, to the 2nd of which (*Euolea*) *O. europea* L., the type of the

genus, belongs. The olive tree lives to a great age. In Palestine and other countries there are trees reputed to be many centuries old. A botanical description of the tree, including leaves, inflorescence and fruit, is given.—*John A. Stevenson.*

5955. REHDER, ALFRED. New species, varieties and combinations from the herbarium and the collections of the Arnold Arboretum. Jour. Arnold Arboretum 5: 235-242. 1924.—In this paper the following new species, varieties and hybrids are described and the following new combinations are proposed: *Juglans notha* (*J. regia* × *Sieboldiana*) and var. *Batesii*; *Philadelphus Delavayi* Stapf var. *calvescens*; *Neillia sparsiflora*; *Prunus yedoensis* var. *perpendens* Wils.; *Thea Henryana* (C. Stuart); *T. Pitardii* (C. Stuart); *T. Crapnelliana* (Tutcher); *Cornus dubia* (C. amomum × *paucinervis*); *Osmanthus ilicifolius* Standish f. *variegatus* (Standish), f. *aureus* (Bailey), f. *purpureus* (Nichols.), and f. *rotundifolius* (Jaeger); *Buddleia Davidii* var. *nanhoensis* (Chittend.); *Viburnum acerifolium* L. f. *ovatum*; *Dipelta floribunda* Maxim. var. *parviflora*; and *Diervilla Middendorffiana* Carr. f. *bicolor* (Regel).—*Author.*

5956. ROGERS, R. S. Contributions to the orchidology of Australia and New Zealand. Trans. and Proc. Royal Soc. South Australia 46: 148-159. 1922.—*Diuris brevifolia* n. sp., near *D. sulphurea*, is described, and a key is given to the South Australian members of the genus. The following new species and varieties are also described; *Prasophyllum Brainei*, *P. Frenchii* F. v. M. var. *Tadgellianum*, *P. australe* R. Br. var. *viscidum*, *Pterostylis humilis*, *Caladenia pumila*, *C. carnea* Br. var. *aurantiaca*. Notes on special features of *Dendrobium dicuphum* F. v. M., *Spiranthes australis* Lindl. and several other species are given.—*Wm. Randolph Taylor.*

5957. ROHLENA, JOS. Einige Novitäten aus Montenegro. [Some new things from Montenegro.] Repert. Spec. Nov. Regni Veg. 17: 33-34. 1921. (Repert. Eur. et Med. 1: 417-418. 1921.)—The following new names, combinations, and forms are included: *Centaurea crnogorica* (*C. atropurpurea* W. K. subsp. *crnogorica*) is described as intermediate between *C. atropurpurea* W. K. and *C. orientalis* L.; *C. Willdeniana* Rehb. f. *denudata*; *C. atropurpurea* W. K. f. *gracilior*; *Festuca violacea* Gaud. var. *minor* Hackel f. *mutica*; *F. varia* Haenke var. *pungens* (Kit.) Hackel subvar. *pseudoranthia*; *Sesleria coerulea* Scop. var. *calcarea* (Pers.) Čelak. f. *scabridula*; *S. tenuifolia* Schrad. f. *pubiglumis* and f. *longiaristata*; *Anthoxanthum ovatum* Lag. f. *laxiflorum*; *Polygonatum Velenovskyi*; *Verbascum Nicolai* Rohlena var. *obtusifolium*, and *V. thapsiforme* Schrad. subsp. *Vandasii*.—*John E. Dinsmore.*

5958. RONNIGER, KARL. Neue Arten von Galium. [New species of Galium.] Repert. Spec. Nov. Regni Veg. 17: 42-43. 1921. (Repert. Eur. et Med. 1: 426-427. 1921.)—Descriptions of the following new species are given: *Galium adriaticum* from Ostarje in South Croatia and from Monte Marian in Dalmatia; *G. scabridiforme* from Mount Krstilovica in Serbia; and *G. kurdicum* from Bitlis in Kurdistan.—*John E. Dinsmore.*

5959. SCHLECHTER, R. Mitteilungen ueber europäische und mediterrane Orchideen. III. [European and Mediterranean orchids. III.] Repert. Spec. Nov. Regni Veg. 16: 369-379. 1920 (Repert. Eur. et Med. 1: 401-411. 1920).—The history of the genus *Coeloglossum* Hartm. is given and a description, in Latin, of the genus by Nyman, as emended by the author. The following species are described: *Coeloglossum viride* (L.) Hartm.; *C. bracteatum* (*Orchis bracteatum* Willd.); *C. kaschnirianum* from Kashmir; and *C. coreanum* (*Orchis coreana* Nakai). Two insufficiently known orchids from the Azores are described: *Platanthera micrantha* (Hochst.) Schltr. n. comb. and *P. azorica* Schltr. n. nom., both described originally by Hochstetter under *Habenaria*.—*John E. Dinsmore.*

5960. SHAW, GEORGE RUSSELL. Notes on the genus Pinus. Jour. Arnold Arboretum 5: 225-227. 1924.—The origin of the oblique cone and the sectional characters of the genus are discussed. In the revised classification of the genus the group *Flexiles* is referred to the *Strobi*. A note on *Pinus Krempfii* H. Lec., which is placed in the group *Balfourianae*, concludes the paper.—*Alfred Rehder.*

5961. STOJANOV, N., UND B. STEFANOV. Zwei neue Pflanzen aus Bulgarien. [Two new plants from Bulgaria.] Oesterreich. Bot. Zeitschr. 70: 103-107. 3 fig. 1921.—*Vicia orbelica* and *Jasione bulgarica* are described as new. The former is most closely related to *V. montenegrina* Rohl. and the latter to *J. orbiculata* Griseb. The differences between them are tabulated and the new species are illustrated.—*T. D. Howe.*

5962. TOVEY, J. R., AND P. F. MORRIS. Contributions from the National Herbarium of Victoria, No. 2. Proc. Roy. Soc. Victoria N.S. 35: 86-89. Pl. 5. 1922.—The following additions are reported: *Aristida Behriana* F. v. M., brush spear grass, from an additional locality in Victoria; *Helipterum australe* (A. Gray) Ostenf.; *H. roseum* Benth. var. *patens* (Ewart) Black, list of localities given and synonymy discussed; *Microseris scapigera* Sch. Bip., synonymy given; *Oxalis purpurata* Jacq., purplish wood-sorrel, an additional locality in Victoria of this South African weed; *Paulownia tomentosa* Steud., downy or imperial *Paulownia* native of Japan newly recorded as growing wild in Victoria, probably as a garden escape; *Pterostylis alata* (Lab.) Reichb. f. var. *robusta* (Ewart) n. comb.; *Scorzonera laciniata* L., torn vipers grass, long roots used like salsify, a native of the Mediterranean and the Caucasus, first record of wild growth, probably a garden escape; *Solanum rostratum* Dunal, "Buffalo Burr" or pincushion nightshade, found to be identical with *S. heterandrum* Pursh.; *S. triflorum* Nutt. spreading or 3-flowered nightshade (berries poisonous), native of northwestern America, found wild, likely to become a troublesome pest, now under provisions of the "Thistle Act;" *Teucrium racemosum* R. Br. var. *polymorphum* n. var., figured in plate and Latin description given, resembles *T. racemosum* but differs in having stamens inserted in the corolla and not exerted, the stigma only slightly exerted. The ovary has 4 cells in most cases, 2 of the cocci are non-fertile or abortive; *Trichinium exaltatum* Benth. ("lambstails") from a new Victoria locality, it is also found in all other Australian States except Tasmania.—Eloise Gerry.

5963. TOVEY, J. R., AND P. F. MORRIS. Contributions from the National Herbarium of Victoria, No. 3. Proc. Roy. Soc. Victoria N.S. 35: 194-196. 1923.—A new species from West Australia, *Kunzea sulphurea*, is described and placed in *Eukunzea* near *K. micrantha* Schau. New regional distribution of the following native and introduced plants is given: *Crassula exserta* (Reader) Ostenf.; *Statice Thouini* Viv. ("Thouin's sea lavender"); *Bromus Cebadilla* Steud. ("Chillian Brome Grass"); and *Tradescantia fluminensis* Vell. ("water spiderwort" of Brazil) exotic, not yet fully naturalized. The following alterations are made in accordance with article 48 of the Vienna Botanical Congress (1905): *Cladium acutum* (Lab.) Poir. (*C. schoenoides* R. Br., *Schoenus acutus* Lab.); *C. tetragonum* (Lab.) J. M. Black (*Lepidosperma tetragona* Lab., *C. tetraquetrum* Hook. f.); *Scirpus americanus* Pers. (*S. pungens* Vahl); *S. antarcticus* L. (*S. cartilagineus* Poir., *Isolepis cartilaginea* R. Br.); *Distichlis spicata* (L.) Greene (*Uniola spicata* L., *D. maritima* Rafin.); *Imperata cylindrica* (L.) Beauv. (*Lagurus cylindricus* L., *I. arundinacea* Cyr.); *Poa Drummondii* Nees (*P. nodosa* Nees); *Helichrysum cuneifolium* n. comb. (*Cassinia cuneifolia* DC. (1837), *Ozothamnus Backhousii* Hook. f. (1860), *H. Backhousii* F. v. M. (1866)); *H. lepidophyllum* n. comb. (*Baccharis lepidophylla* DC. (1837), *Ozothamnus lepidophyllus* Hook. f. (1847), *H. baccharoides* F. v. M. (1886)); *H. oblongifolium* n. comb. (*H. cuneifolia* F. v. M. (1866)); *H. Steetzianum* n. comb. (*H. lepidophyllum* F. v. M. (1866), *Ozothamnus lepidophyllus* Steetz. (1844-5)). The following species identified at Kew are listed as additions to the introduced flora of Coode Island: *Agathosma apiculata* E. Mey., *Anthericum longifolium* Jacq., *Capnophyllum africanum* Koch, *Passerina filiformis* L., *Sutera floribunda* O. Ktze., all natives of South Africa; *Phacelia tanacetifolia* Benth. of California. These species are exotics not yet naturalized.—*Trichinium obovatum* Gaud. var. *grandiflorum* Benth. (*T. incanum* R. Br. var. *intermedium* Ewart & White) is also included in the list of additions.—Eloise Gerry.

5964. WALL, A. *Haastia Greenii* Hook. f.: What is it? Rec. Canterbury Mus. [New Zealand] 2: 235-238. 1924.—*Haastia Greenii* is a species published by Kirk from Hooker's manuscript account of a plant collected by Green on Mount Cook in 1882, but not again collected or seen. After detailed examination of the locality, and correspondence with Kew, the writer concludes that the name *Haastia Greenii* should be recorded as a synonym of *Raoulia eximia* Hook. f., with which the type specimen is identical.—H. H. Allan.

5965. WEATHERBY, C. A. A new *Satureja* from Florida. *Rhodora* 26: 80-81. 1924.—*S. Ashei*, n. sp., is described and a key is given showing its differentiation from related species.—M. L. Fernald.

5966. WEATHERBY, C. A. A note on *Stellaria pubera* Michx. *Rhodora* 26: 169-171. 1924.—A study of *Stellaria pubera* was made and the conclusion reached that it consists of

2 well defined geographic varieties: typical *S. pubera* (*Alsine pubera tennesseensis* Mohr), ranging from New Jersey to Indiana and southward; and var. *silvatica* (Béguinot) n. comb. (*Alsine tennesseensis* Small, as to plant described), occurring chiefly west of the Alleghanies.—*M. L. Fernald.*

5967. WIEGAND, K. M. Some changes in nomenclature. *Rhodora* 26: 1-5. 1924.—The following new combinations or new names are published: *Typha angustifolia* L. var. *elongata* (Dudley), *Muhlenbergia mexicana* (L.) Trin. f. *commutata* (Scribn.), *M. foliosa* Trin. f. *ambigua* (Torr.), *Agrostis tenuis* Sibth. f. *aristata* (Parnell), *Eriophorum virginianum* L. f. *album* (Gray), *Carex tenera* Dewey var. *echinodes* (Fernald), *C. umbellata* Schk. f. *vicina* (Dewey), *C. hystericina* Muhl. f. *Dudleyi* (Bailey), *Polygonum Muhlenbergii* (Meisn.) Watson f. *nutans*, *Oenothera parviflora* L. var. *angustissima* (Gates), *O. biennis* L. var. *nutans* (Atkins. & Bartl.), *O. biennis* L. var. *pyncocarpa* (Atkins. & Bartl.), *Rhododendron nudiflorum* (L.) Torr. var. *roseum* (Lois.), *Aster lucidulus* (Gray), *Bidens frondosa* L. var. *pallida* (Wiegand), and *Arctium minus* Bernh. var. *corymbosum*.—*M. L. Fernald.*

5968. WILLIAMSON, H. B. Description of a new Victorian *Helichrysum*. *Proc. Roy. Soc. Victoria. N. S.* 35: 24-25. *Pl.* 5. 1922.—The description of *Helichrysum Gatesii* n. sp. is given in Latin together with figures of a bisexual floret, a female floret flower, and bracts. The plant occurs not rarely on hard dry ground on hillsides, Lorne, Victoria, according to A. C. F. Gates, Dec. 7, 1921. It flowers from December to April. The plant is 15 cm. high, with the habit and general aspect of *Leptorrhynchus Waitzia* or *L. pulchellus*, with alternate leaves, and with stems and the under side of the leaves woolly white. The flower heads are solitary on rather long stems, with distant leafy bracts toward the flower heads; involucre bracts not expanding into a ray, the outer ones shorter, and all embedded in cottony wool growing from their edges, wrinkled, and with light golden ciliate tips; florets scarcely exceeding the involucre, with about 20 pappus bristles, excepting the few female florets which have about 12; all pappus bristles sparsely barbellate below, shortly plumose at the summit; achenes glabrous, not beaked.—Difficulty was encountered in assigning a place to this plant. The bracts indicate *Iriolaena* but the numerous pappus bristles, plumose at the summit, shut it out of that genus. It is ruled out of *Leptorrhynchus* on account of the shortness of the florets and absence of distinct upward narrowing of the achenes. It approaches *Helichrysum ambiguum* Turcz. (*Leptorrhynchus* Bth.) but that species has female florets with few or no pappus bristles and a very different involucre. From *H. rutidolepis* it is distinguished by having all flowers provided with at least 12 pappus bristles and by the short ciliate wrinkled laminae of the bracts. It may be considered as forming a link between sections *Oxylepis* and *Chrysocephalum* and is placed next to *H. podolepideum*, its nearest affinity, a brief description of which is given which also points out the likeness of features of that species to *H. apiculatum*.—*Eloise Gerry.*

5969. WILSON, ERNEST H. A new species of *Reevesia*. *Jour. Arnold Arboretum* 5: 233-235. 1924.—A new species from western China is described as *Reevesia sinica*.—*Alfred Rehder.*

5970. WOLFF, H. *Biasolettia Bornmülleri* von Thasos. [*Biasolettia Bornmülleri* from Thasos.] *Repert. Spec. Nov. Regni Veg.* 17: 43. 1921. (*Repert. Eur. et Med.* 1: 427. 1921).—A description in Latin is given of this new species, *Biasolettia Bornmülleri* (*Freyera balcanica* Hal. in sched.).—*John E. Dinsmore.*

5971. WOLFF, H. *Pimpinella ambigua* K. Koch msc. in *Herb. berol.* *Repert. Spec. Nov. Regni Veg.* 17: 44-45. 1921. (*Repert. Eur. et Med.* 1: 428-429. 1921).—A description in Latin is given of this new species, originally collected by Koch in the mountains of Pontus, later from Otingo in Transcaucasia.—*John E. Dinsmore.*

5972. WOLFF, H. *Spiroceratium* nov. gen. *Umbelliferarum balearicum*. *Repert. Spec. Nov. Regni Veg.* 17: 45. 1921. (*Repert. Eur. et Med.* 1: 429. 1921).—A description in Latin is given of this new genus to which *Spiroceratium Bicknellii* (*Pimpinella Bicknellii* Briq.) is referred.—*John E. Dinsmore.*

REVISIONS AND MONOGRAPHS

5973. BABCOCK, ERNEST BROWN, AND HARVEY MONROE HALL. *Hemizonia congesta*: a genetic, ecologic, and taxonomic study of the hayfield tarweeds. Univ. California Publ. Bot. 13: 15-100. Pl. 1-7. 1924.—The phylogeny of the elements of a complex species of Compositae has been worked out upon the basis of experiment as well as the criteria usually employed. New names and combinations which appear are: *Hemizonia congesta* DC. subsp. *lutescens* (*H. luzulaefolia* var. *lutescens* Greene), *H. congesta* subsp. *calyculata*, *H. congesta* subsp. *luzulaefolia* (*H. luzulaefolia* DC.), *H. congesta* subsp. *Tracyi*, *H. congesta* subsp. *Clevelandi* (*H. Clevelandi* Greene). (See also Bot. Absts. 14, Entry 4304.)—Authors.

5974. CAMUS, A. Note sur le genre *Dichanthium* Willemet. [The genus *Dichanthium*.] Bull. Mus. Hist. Nat. [Paris] 27: 548-550. 1921.—The author presents a key to, and a synopsis of the 9 species of this genus of grasses distributed in southern Asia, Africa, Australia, and Malasia.—John M. Fogg, Jr.

5975. FERNALD, M. L. The dwarf *Antennarias* of northeastern America. *Rhodora* 26: 95-102. Pl. 142. 1924.—The author presents a monographic study of the small-leaved species of eastern America centering about *A. alpina* (L.) Gaertn. Eleven species are recognized and illustrated, all from Labrador, Newfoundland and Quebec, and the remaining 15 species of eastern America are included in the key. Two new species, *A. vexillifera* and *A. Peasei* are described.—Author.

5976. FERNALD, M. L. The eastern American representatives of *Arnica alpina*. *Rhodora* 26: 103-107. Pl. 143. 1924.—A monographic treatment with key and descriptions and illustrations of 7 species is presented. *A. Griscomi* is a new species.—Author.

5977. NANNFELDT, J. A. Revision des verwandtschaftskreises von *Centella asiatica* (L.) Urb. [Revision of *Centella asiatica* and allied forms.] Svensk Bot. Tidskr. 18: 397-426. Pl. 6-7, 2 fig. 1924.—The author's studies led him to the conclusion that the species *Centella asiatica* (L.) Urb. contains several distinct species and thus should be divided. The genus *Centella* is divided into 2 subgenera, *Solandra* and *Trisanthus*. The latter is further divided into 4 sections, *Rubescentes*, *Villosae*, *Erianthae*, and *Asiaticae*, to which a key is given. The work deals in detail with 11 species, belonging to the last-mentioned section. A Latin key of these species is also given. In addition, some imperfectly known species of the same section are considered. The following are the 11 satisfactorily known species: *Centella ulugurensis* (Engl.) Dom., *C. repanda* (Pers.) Small., *C. asiatica* (L.) Urb. and the following new species or combinations: *C. hirtella*, *C. Dusenii*, *C. floridana* (*Hydrocotyle asiatica floridana* Coult. & Rose), *C. uniflora* (*Hydrocotyle uniflora* Col.), *C. triflora* (*Hydrocotyle triflora* Ruiz & Pavon), *C. coriacea*, *C. cordifolia* (*Hydrocotyle cordifolia* Hook. fil.), and *C. biflora* (*Hydrocotyle biflora* Vell.).—O. Heilborn.

5978. PENLAND, C. WILLIAM. Notes on North American *Scutellarias*. *Rhodora* 26: 61-79. Pl. 140, 141. 1924.—This is a study of *Scutellaria* in temperate North America, based upon the characters of the nutlets. The possession of winged nutlets has been considered a distinctive generic character of *Perilomia*, but the author finds a reputed *Perilomia* (*P. ocymoides*) without the wing, and in a number of quite typical North American species of *Scutellaria* the wing is present. He believes that this character is not of great value as a generic distinction but that it has been secondarily acquired; for, taking the widespread *S. lateriflora* and *S. epilobiifolia* as "nearest the ancestral branch of the phylogenetic tree," he conceives that both have given rise to younger groups in which winged nutlets occur. An artificial key based on nutlet-characters is provided and 15 drawings show the different types of seed. Twenty-one species are recognized north of Mexico. The following are new or new combinations: *S. Bolanderi* var. *californica* (Gray), *S. nervosa* f. *ternata*, *S. resinosa* var. *brevifolia* (Gray), *S. integrifolia* var. *glabriuscula* (Fernald) and var. *floridana* (Chapm.), *S. serrata* var. *montana* (Chapm.), *S. saxatilis* var. *arguta* (Buckley).—M. L. Fernald.

5979. PFEIFFER, H. Der Formenkreis des *Scirpus capillaris* L. [Varieties of *Scirpus capillaris*.] Bot. Archiv. 6: 186-193. 1924.—The author presents a comprehensive review of *Scirpus capillaris* L., recognizing several distinct species and subordinate categories. The following are designated as new combinations: *Stenophyllus scabrus* (*Isolepis scabra* Presl),

S. circinatus (*Bulbostylis circinatus* Kth.), *S. hirtellus* (*Isolepis hirtella* Schrad.), *S. Francaensis* (*Bulbostylis Francaensis* Palla), *S. filiformis* (*B. filiformis* C. B. Clarke), and *S. tenellus* (*Isolepis tenella* Link. An "Index Atque Nomenclatar" is appended.—William Seifriz.

5980. WILLIAMSON, H. B. A revision of the genus *Pultenaea*, Part III. Proc. Roy. Soc. Victoria. N. S. 35: 97-107. Pl. 7. 1922.—The following species are discussed and Latin descriptions given of new forms: *Pultenaea capitellata* Sieber; *P. ferruginea* Rudge; *P. canaliculata* F. v. M. together with var. *latifolia*; *P. pedunculata* Hooker (*P. Ausfeldii* Regel) vars. *pilosa* and *latifolia*; *P. Cunninghamii* (Bth.) F. v. M. (*Spadostyles Cunninghamii* Bth., *P. ternata* F. Muell.) var. *pubescens* Bth.; *P. spinosa* (*Oxylobium spinosum* DC., *Euchilus cuspidatus* F. v. M., *P. ternata* F. v. M. var. *cuspidata* Bth.); *P. Kenyi*; *P. teretifolia* and var. *brachyphylla*; *P. D'Altonii*; *P. prolifera*; *P. Boormanii*; *P. Readeriana*; *P. barbata* C. Andrews; *P. arida* E. Pritzel; *P. subalpina* (F. v. M.) Druce; *P. hiberttioides* Hooker f. and var. *conferta* Bth.; *P. mollis* Lindl.; and *P. viscosa* R. Br.—Eloise Gerry.

FLORISTICS AND PLANT DISTRIBUTION

5981. ANONYMOUS. The hawthorn the official state flower. Missouri Bot. Gard. Bull. 11: 45-55. Pl. 10-11. 1923.—The adoption by the state legislature of the hawthorn as the state flower is made the occasion for a systematic summary of the species known to occur in Missouri. One hundred and eight species in 11 groups are listed.—O. T. Wilson.

5982. ARNELL, H. WILH. Anteckningar om Gästriklands Kärilväxter. [Vascular plants in Gästrikland (province in Sweden).] Svensk Bot. Tidskr. 18: 85-127. 1924.—Extensive lists of species are given.—O. Heilborn.

5983. BALL, CARLETON R. Extensions of range and a new variety in *Salix*. *Rhodora* 26: 135-144. 1924.—*Salix discolor* Overi n. var. from South Dakota, is characterized as a broad-leaved extreme, somewhat paralleled in the region by broad-leaved forms of other species; *S. missouriensis* Bebb is recorded in Iowa, Illinois, South Dakota and apparently North Dakota, and notes upon its specific characters are given; the western range of *S. petiolaris* Sm. is more definitely defined; the prairie distribution of *S. candida* Flüge is extended into South Dakota and the distribution of *S. candida denudata* Anderss. is discussed; the range of *S. pellita* Anderss. is extended southward in Michigan.—M. L. Fernald.

5984. BLAKE, S. F. *Erucastrum Pollichii* in West Virginia. *Rhodora* 26: 22-23. 1924.—A European crucifer, sporadic and rare in eastern America but well established in North Dakota, is recorded from West Virginia.—M. L. Fernald.

5985. BORNMÜLLER, J. Zur Flora der Rhön. [The Rhone flora.] Repert. Spec. Nov. Regni Veg. 16: 380-384. 1920. (Repert. Eur. et Med. 1: 412-416. 1920.)—The author gives localities, mostly in the Tann district, for more than 40 species, and the description of 1 new variety, *Lilium Martagon* L. var. *flavidum* from Bergwiesen, Rhöngebirge.—John E. Dinsmore.

5986. BRUNKER, J. P. Some botanical records from Co. Wicklow. *Irish Nat.* 33: 114-116. 1924.

5987. BUCHHOLZ, JOHN T., AND WILBUR R. MATTOON. Common forest trees of Arkansas. How to know them. A pocket manual. Coll. Agric. Univ. Arkansas [Fayetteville] Ext. Circ. 180. 1-84. 82 fig. 1925.—Eighty-two trees are described in non-technical terms and the descriptions supplemented by figures showing distinctive characters of each species. Brief mention is made of 33 other varieties or species, all of which are native to the state of Arkansas.—J. M. Greenman.

5988. CLUTE, WILLARD N. An albino *Callicarpa*. Amer. Bot. [Joliet, Illinois] 31: 29. 1925.—The name *Callicarpa americana alba* is given to a form with pure white fruits and white flowers, collected by H. A. Rankin in Columbus County, North Carolina.—Susan P. Nichols.

5989. CLUTE, WILLARD N. Yellow-red fruits. Amer. Bot. [Joliet, Illinois] 31: 32-33. 1925.—The author reports *Prunus virginiana* L. *leucocarpa* Wats. from Lawrenceville, New York. A yellow fruited variety, *flavicarpa*, of our native *Viburnum Opulus* L. is reported from Grand Forks, North Dakota.—Susan P. Nichols.

5990. COBURN, LOUISE HELEN. *Gentiana linearis*, var. *latifolia* in Maine. *Rhodora* 26: 40. 1924.—Record is made of the discovery at Norridgewock, Maine, of this rare plant, new to New England and heretofore known only on Lake Superior and in New Brunswick.—*M. L. Fernald*.

5991. ERDTMAN, G. [Rev. of: AHLFVENGREN, FR. E. *Hallands växter*. (Plants of Halland, Sweden.) *xix* + 207 p. Gleerup: Lund, 1924.] *Svensk Bot. Tidskr.* 18: 519-520. 1924.

5992. FRITSCH, KARL. *Beiträge zur Flora von Steiermark. II.* [Contributions to the flora of Styria.] *Oesterreich. Bot. Zeitschr.* 70: 96-101. 1921.—This paper consists of a list of plants reported from localities where there was no published record of their occurrence.—*T. D. Howe*.

5993. GAUNITZ, D., AND C. B. GAUNITZ. *Bidrag till Kännedom om Kärnväxtfloran i Sorsele socken av Lycksele Lappmark.* [Vascular plants in Sorsele parish in Lycksele (Swedish Lapland).] *Svensk Bot. Tidskr.* 18: 128-140. 1924.—Extensive lists of species are given. *Eriogon unalascensis* (DC.) Vierh. is regarded as the most interesting discovery.—*O. Heilborn*.

5994. GELIN, OLOF. *Mulgedium macrophyllum* DC. i Vaxholm. [*M. macrophyllum* DC. in Vaxholm (southern Sweden).] *Svensk Bot. Tidskr.* 18: 320. 1924.—This plant has probably escaped from a garden.—*O. Heilborn*.

5995. GUILLAUMIN, A. *Contribution à la flore de la Nouvelle-Calédonie. XXXVI.* [Contribution to the flora of New Caledonia.] *Bull. Mus. Hist. Nat. [Paris]* 27: 558-562. 1921.—One hundred species of plants collected in New Caledonia are listed, representing chiefly the following families: Rubiaceae, Compositae, Godeniaceae, Epacridaceae, Myrsinaceae, Sapotaceae, Ebenaceae, Apocynaceae, and Verbenaceae.—*John M. Fogg, Jr.*

5996. HUNNEWELL, FRANCIS WELLES. *Holosteum umbellatum* in Connecticut. *Rhodora* 26: 199. 1924.—*Holosteum umbellatum* L. was recorded from Connecticut in 1885 but, no authentic specimens being found, was subsequently excluded from the later catalogue of the state flora. It abounds as a weed in a nursery at Pomfret.—*M. L. Fernald*.

5997. KNOWLES, M. C. *Spiranthes Romanzoffiana*. *Irish Nat.* 33: 75-76. 1924.—Some criticism is made of a paper by HENRY MOUSLEY in the "Orchid Review" of March, 1924. Time of tuber formation and local varieties in Ireland are discussed.—*W. E. Praeger*.

5998. KNOWLTON, CLARENCE H. Flowering dates for *Amelanchier Barttramiana*. *Rhodora* 26: 178, 179. 1924.—At low altitudes in Quebec, New Hampshire and Massachusetts, this species flowers May 21-28.—*M. L. Fernald*.

5999. KNOWLTON, CLARENCE H. Notes on the plants of Hingham, Massachusetts. *Rhodora* 26: 175-177. 1924.—Records of the author and C. A. Cheever are given, comparing the present flora of Hingham with that recorded by Bouvé in 1893. Five species, including such showy plants as *Asclepias verticillata*, *A. tuberosa*, *Gentiana crinita* and *Sarracenia purpurea*, have become extinct; while *Kalmia latifolia*, *Epigaea repens* and *Ilex opaca* have nearly disappeared. Notes are made on the local occurrence of several selected species.—*M. L. Fernald*.

6000. KNOWLTON, CLARENCE H., AND WALTER DEANE. Reports on the flora of the Boston District. *Rhodora* 26: (Report XLII) 13-19; (XLIII) 34-36; (XLIV) 55-60; (XLV) 82-88; (XLVI) 107-111; (XLVII) 130-132; (XLVIII) 149-152; (XLIX) 166-168. 1924.—Local records are given in LXII for the families Rubiaceae to Lobeliaceae; in LXIII, for the Compositae, alphabetically arranged, from *Acanthospermum* to *Artemisia*; in XLIV, *Aster* to *Bidens*; in XLV, *Bidens* to *Filago*; in XLVI, *Flavaria* to *Lactuca*; in XLVII, *Lapsana* to *Prenanthes*; in XLVIII, *Rudbeckia* to *Solidago*; and in XLIX, *Sonchus* to *Xanthium*.—*M. L. Fernald*.

6001. LEE, WILLIAM E. Irish Sphagna. *Irish Nat.* 33: 98. 1924.—The author gives some new records from the Mourne Mountains.—*W. E. Praeger*.

6002. LILJA, INGEMAR. *Lamium Galeobdolon* L. i Västergötland. [*Lamium Galeobdolon* L. found in Västergötland (province in Sweden).] *Svensk Bot. Tidskr.* 18: 320. 1924.

6003. LORD, ELIZABETH C. Our native wild flowers. Florida Fruits and Flowers 14: 71-74. 1924.—Contrary to the widespread belief that Florida is very poor in wild flowers, the state is said to have a wealth of them, many worthy of garden cultivation. Brief notes,

arranged by the months of the year, from January to December, are given of a considerable number of the more common wild flowers that can be seen blooming in central Florida without even leaving the main highways.—*Arthur S. Rhoads*.

6004. LOWE, RACHEL L. *Saxifraga Aizoon* on Mt. Ktaadn. *Rhodora* 26: 168. 1924.—Record is made of the discovery in the Chimney of Mt. Ktaadn, Maine, of *Saxifraga Aizoon* Jacq., new to the flora of the state, and "colony after colony" of *S. stellaris* L., var. *comosa* Willd.—*M. L. Fernald*.

6005. MORSE, ALBERT P. *Lepidium latifolium* in New England. *Rhodora* 26: 197-198. 1924.—*Lepidium latifolium* L., a coarse Old World perennial, is naturalized at Peabody, Massachusetts. It is likely to become an undesirable weed.—*M. L. Fernald*.

6006. NILSSON, BROR. *Schoenus nigricans* L. funnen på svenska fastlandet. [*Schoenus nigricans* L. found on the Swedish mainland.] *Svensk Bot. Tidskr.* 18: 319-320. 1924.—This species, previously known in Sweden only from the islands Öland and Gotland, has now been found in the province of Scania.—*O. Heilborn*.

6007. NORTH, E. M. Forest preservation—the patriots duty. *Trans. Illinois State Acad. Sci.* 17: 107-112. 1924 [1925].

6008. PEASE, ARTHUR STANLEY. *Eleocharis tuberculosa* in New Hampshire. *Rhodora* 26: 37-38. 1924.—Record is made of the discovery in the Ossipee region, at the base of the White Mountains, of colonies of coastal plain plants including *Eleocharis tuberculosa* (Michx.) R. & S. extended north from Massachusetts, and several other species, *Isoetes Tuckermanni* A. Br., *Panicum spretum* Schultes, *Hemicarpha micrantha* (Vahl) Pax, *Eleocharis diandra* C. Wright, *Scirpus Smithii* Gray, and *Solidago tenuifolia* Pursh, which indicate that the sandy pond-margins of this region would repay extended exploration.—*M. L. Fernald*.

6009. PHILLIPS, R. A. New localities for some rare plants in Ireland. *Irish Nat.* 33: 129-131. 1924.

6010. PHILLIPS, R. A. Some new county and vice-county records of Irish plants. *Irish Nat.* 33: 33-38. 1924.

6011. RYDBERG, P. A. Some extinct or lost and rediscovered plants. I. *Torreyia* 24: 98-101. 1924.—*Astragalus Robbinsii* (Oakes) A. Gray, discovered in 1829 by Dr. Robbins on a limestone ledge on the bank of Winooski River near Burlington, Vermont, has never been correctly reported from any other station and has not been found at the type-locality since 1894, when the station was destroyed by the set-back of a power-dam.—*J. C. Nelson*.

6012. SANFORD, S. N. F. *Hibiscus oculiroseus* in Rhode Island. *Rhodora* 26: 88. 1924.—*Hibiscus oculiroseus* Britton is recorded from a brackish swamp at Narraganset Pier, Rhode Island, an extension of range eastward from southern New York.—*M. L. Fernald*.

6013. SANFORD, S. N. F. Notes on some Rhode Island and southeastern Massachusetts plants. *Rhodora* 26: 127-129. 1924.—Records of new stations are given for *Glaucium flavum* Crantz, *Helianthus mollis* L., *Ranunculus allegheniensis* Britton, *Celtis occidentalis* L., *Conopholis americana* (L. f.) Wallr., *Acer saccharum* Marsh., *Polygonum virginianum* L., *Hieracium florentinum* All., *Ilex opaca* Ait., and *Nyssa sylvatica* Marsh.—*M. L. Fernald*.

6014. SMITH, C. P. *Pseudotaenidia* in Maryland. *Rhodora* 26: 23-24. 1924.—Report is made of the chance discovery in Alleghany County, Maryland, of the rare *Pseudotaenidia*; and the suggestion is offered that careful botanizing may show the plant to be more common than at present supposed.—*M. L. Fernald*.

6015. STEFANOV, B. Für die Flora Bulgariens neue und seltene Pflanzen. [New and rare Bulgarian plants.] *Oesterreich. Bot. Zeitschr.* 70: 111-114. 1921.—Thirty-five species are listed which previously were either unknown in Bulgaria or known only from isolated localities. *Fraxinus coriariaefolia* Scheele had not previously been found in Europe.—*T. D. Howe*.

6016. STELFOX, A. W. *Saxifraga umbrosa* native in the Wicklow Mountains. *Irish Nat.* 33: 60-61. 1924.

6017. STELFOX, A. W. The white form of *Orchis Fuchsii* and *Orchis O'Kellyi*. *Irish Nat.* 33: 143-144. 1924.

6018. STOJANOV, N. Für die Flora Bulgariens neue Pflanzen. [New Bulgarian plants.] *Oesterreich. Bot. Zeitschr.* 70: 107-111. 1921.—Sixty species and varieties are listed, most of which were collected in 1920.—*T. D. Howe*.

6019. THISELTON-DYER, WILLIAM T. (Editor). *Flora capensis: being a systematic description of the plants of the Cape Colony, Caffraria, and Port Natal (and neighbouring territories)*. 8 vo. Vol. V., Sect. II. vii + 529-606 p. L. Reeve & Co., Ltd.: London, Jan., 1925.—The present part includes the balance of the Moraceae (*Ficus*) and the Myricaceae by JOHN HUTCHINSON; the Urticaceae by N. E. BROWN; the Betulaceae, Salicaceae, and Ceratophyllaceae by S. A. SKAN. A brief Addenda and Corrigenda is also added. The following new species, varieties and combinations are proposed: *Ficus ingens* Miq. var. *tomentosa* Hutchinson, *Urtica Burchellii* N. E. Brown, *Fleurya alatipes* N. E. Brown (*Laportea alatipes* Hook. f.), *Pilea Worsdellii* N. E. Brown, *Australina paarleensis* N. E. Brown, *A. procumbens* N. E. Brown, *A. Thunbergii* N. E. Brown (*Urtica capensis* Thunb.), *A. lanceolata* N. E. Brown (*Parietaria lanceolata* Thunb.), *Droguetia Woodii* N. E. Brown, *D. Burchellii* N. E. Brown, *Salix Woodii* Seemen var. *Wilmsii* Skan (*S. Wilmsii* Seemen), *S. hirsuta* Thunb. var. *parvifolia* Skan, *Arthrosolen compactus* C. H. Wright, *Gnidia aberrans* C. H. Wright, and *Euphorbia verruculosa* N. E. Brown.—J. M. Greenman.

6020. THONE, FRANK. Preliminary check list of the vascular plants of the Illinois State Park at Starved Rock, LaSalle County. Trans. Illinois State Acad. Sci. 17: 100-106. 1924 [1925].—Starved Rock is the first of the state parks established in Illinois. It is a region of great scenic beauty and great botanical wealth of material. The writer lists 21 species of ferns and fern-allies, 4 species of gymnosperms, 50 species of monocots, 325 species of dicots. A bibliography is appended.—H. W. Henderson.

6021. VESTERLUND, OTTO. Förteckning över fanerogam-och kärlkryptogamfloran inom Jockmocks och Kvikjocks skogsregion. [Vascular plants in the forest region of Jockmock and Kvikjock (Swedish Lapland).] Svensk Bot. Tidskr. 18: 292-311. 1924.—An extensive list of plants is given.—O. Heilborn.

6022. WEATHERBY, C. A. Two or more wool-waste plants from Westford, Mass. *Rhodora* 26: 38-39. 1924.—The author records the discovery by the late Emily F. Fletcher of true European *Agrimonia Eupatoria* L. and *Verbascum thapsiforme* Schrad., the latter covering "an eighth of an acre;" both species apparently were not previously known in North America. M. L. Fernald.

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

SAM F. TRELEASE, *Editor*

6023. ANONYMOUS. List of members, 1923. Proc. Roy. Soc. Victoria. n. s. 35: 205-212. 1923.—This gives patron, honorary, life, ordinary, country, corresponding, and associate members of the Royal Society of Victoria with their addresses and dates of affiliation.—Eloise Gerry.

6024. ANONYMOUS. Plant labels in use at the Missouri Botanical Garden. Missouri Bot. Gard. Bull. 11: 55-58. Pl. 12. 1923.

6025. ANONYMOUS. Tagua or vegetable ivory. Missouri Bot. Gard. Bull. 11: 137-139. Pl. 35. 1923.

6026. DUGGAR, B. M., H. C. COWLES, AND H. H. WHETZEL. International congress of plant sciences. Science 61: 58-59. 1925.—Announcement is made of the 4th International Botanical Congress to be held in Ithaca, New York, Aug. 16-23, 1926.—C. J. Lyon.

6027. FAIRCHILD, DAVID. The Soledad Garden and Arboretum. Jour. Heredity 15: 451-461. Fig. 8-15. 1924.—The garden and arboretum established by Edwin F. Atkins on the south coast of Cuba has developed during the 25 years of its existence into an ideal place for the investigation and breeding of plants. Recently it has been put under the control of Harvard University, and a laboratory has been established. These facilities have been put at the disposal of accredited investigators.—R. Cook.

6028. FANTHAM, H. B. Science in South Africa. Nature 114: 802-804. 1924.—This is a brief report of the meeting of the South African Association for the Advancement of Science at Cape Town, July 7-12.—O. A. Stevens.

6029. KEENAN, G. L. The value of micro-analytical methods and examples of their application. Jour. Amer. Pharm. Assoc. 14: 112-113. 1925.—The author points out that the

microscope continues to increase in importance as a working tool of the analyst. The following topics, with examples, are briefly discussed: (1) Identification of plant ingredients, (2) micro-chemical tests, (3) optical crystallographic methods, and (4) quantitative microscopy.—*Anton Hogstad, Jr.*

6030. KOCH, HERBERT. *El Instituto Bacteriologico de Buenos Aires.* [The Bacteriologic Institute of Buenos Aires.] *Minerva-Zeitschr.* 1: 56-57. 1924.

6031. MOORE, GEORGE T. Thirty-fourth annual report of the director. *Missouri Bot. Gard. Bull.* 11: 1-15. *Pl. 1.* 1923.

6032. NEEDHAM, GEORGE H. A new method for the preparation of *Styrax* and *Balsam of Tolu* for use as a microscopic mounting media of high refractive index. *Jour. Amer. Pharm. Assoc.* 13: 424-425. 1924.—For a proper study of diatoms, a medium of high refractive index is a necessity. Microscopists have used such materials as *Styrax* (refractive index 1.582), *Balsam of Tolu* (1.618), and artificial realgar (2.549). In order to obtain best results with *Styrax* or *Balsam of Tolu*, the material should be specially prepared in order to eliminate a precipitation when xylol or chloroform is added. The materials may be prepared as follows: Dissolve in warm absolute alcohol and filter. Pour off the resultant liquid slowly and with constant stirring, into 10-20 times its volume of distilled water. Allow resinous materials to settle and then decant. Free the resins from adhering water and re-dissolve in alcohol. Repeat the process of precipitating, etc. Transfer to evaporating dish and dry in a hot-water oven. Dissolve in a sufficient quantity of chloroform.—For proper examination, the diatoms are cleared in xylol on a slide; superfluous liquid is drained off and 2-3 drops of mounting medium are added. Volatilize the chloroform by covering the slide with a watch glass and heating to 60° for ½ hour. Then mount as usual.—This simple method of purification frees the materials from cinnamic or benzoic acids or both.—*Anton Hogstad, Jr.*

6033. NOLAN, J. J. Dust in the atmosphere. *Nature* 114: 720-722. 3 fig. 1924.—Special reference is made to the work of Aitken. Figure 2 represents some spores, "organic particles of definite structure," but they are not named or discussed.—*O. A. Stevens.*

6034. SEARLE, G. O. The mass production of sections of flax stems. *Jour. Roy. Microsc. Soc. London* 1924: 281-288. *Pl. 18, 1 diagr.* 1924.—A detailed description is given of a method by which large numbers of flax stems can be fixed, sectioned and stained in a very short time.—*Ralph E. Cleland.*

6035. TANSLEY, A. G. Some aspects of the present position of botany. (Presidential address, Section K.) *Rept. British Assoc. Adv. Sci.* 1923: 240-260. [1924.]—The object of plant morphology of the last generation was the construction of a genealogical tree, the finding of group ancestors. This has been disappointing. It is the history of such researches, that the better a newly discovered group has become known, the less probably it appears to represent the common ancestors of other existing or fossil groups. Such researches, however, have greatly added to our knowledge of the forms and structures of plants, especially of vascular plants, and we have learned to evaluate the structures of the vascular system as a guide to to evolution, in contrast to the great stress heretofore laid upon the reproductive structures. The principle of parallel evolution has been more widely extended. Owing to the apparent hopelessness of tracing out the various lines of evolution, comparative morphology is becoming a much neglected subject. The process of development is now receiving the greatest attention. In addition to the usual explanations of the origin of new species, as hybridization and mutation, the possibility of long continued action of the environment altering genes or creating new ones cannot be rejected. A way will perhaps ultimately be found to an understanding of how genes produce the characters of an organism, by studying the detailed ontogenetic processes which lead up to the appearance of a structure over and above that reaction of structure upon function. The futility of attempting to assign a function to every structure is to be emphasized, as the organism is the result of blind processes and may produce useless or even harmful structures provided the organism as a whole is not greatly affected in its life processes. A plea is made for the coördination of botanical subjects, especially of physiology and morphology, to counter-balance the modern tendency to separate botany into disconnected subjects and to supply the lack of a unified knowledge of the subject to both the beginning student and research worker.—*C. L. Wilson.*

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